NASA SP-7039(23)
Section 1
Abstracts

25th Anniversary
1958-1983

NASA PATENT ABSTRACTS BIBLIOGRAPHY

A CONTINUING BIBLIOGRAPHY

Section 1 • Abstracts

JULY 1983

(NASA-SP-7039(23)) NASA PATENT ABSTRACTS BIBILIOGRAPHY. SECTION 1: ABSTRACTS. A CONTINUING BIBLIOGRAPHY (National Aeronautics and Space Administration) 56 p HC A04 CSCL 05B 00/82 N84-13017 Unclas 42885

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

NASA SP-7039(23) NASA Patent Abstracts Bibliography

ACCESSION NUMBER RANGES

Bibliography Number	*STAR Accession Numbers*
NASA SP-7039(04)	N69-20701 – N73-33931
NASA SP-7039(12)	N74-10001 – N77-34042
NASA SP-7039(13)	N78-10001 – N78-22018
NASA SP-7039(14)	N78-22019 – N78-34034
NASA SP-7039(15)	N79-10001 – N79-21993
NASA SP-7039(16)	N79-21994 – N79-34158
NASA SP-7039(17)	N80-10001 – N80-22254
NASA SP-7039(18)	N80-22255 – N80-34339
NASA SP-7039(19)	N81-10001 – N81-21997
NASA SP-7039(20)	N81-21998 – N81-34139
NASA SP-7039(21)	N82-10001 – N82-22140
NASA SP-7039(22)	N82-22141 – N82-34341
NASA SP-7039(23)	N83-10001 – N83-23266

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NASA SP-7039(23)
Section 1
Abstracts

NASA

PATENT ABSTRACTS BIBLIOGRAPHY

A CONTINUING BIBLIOGRAPHY

Section 1 • Abstracts

Annotated references to NASA-owned inventions covered by U.S. patents and applications for patent that were announced in *Scientific and Technical Aerospace Reports (STAR)* between January 1983 and June 1983.

NASA Scientific and Technical Information Branch 1983
National Aeronautics and Space Administration
Washington, DC

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INTRODUCTION

Several thousand inventions result each year from the aeronautical and space research supported by the National Aeronautics and Space Administration. The inventions having important use in government programs or significant commercial potential are usually patented by NASA. These inventions cover practically all fields of technology and include many that have useful and valuable commercial application.

NASA inventions best serve the interests of the United States when their benefits are available to the public. In many instances, the granting of nonexclusive or exclusive licenses for the practice of these inventions may assist in the accomplishment of this objective. This bibliography is published as a service to companies, firms, and individuals seeking new, licensable products for the commercial market.

The *NASA Patent Abstracts Bibliography (NASA PAB)* is a semiannual NASA publication containing comprehensive abstracts and indexes of NASA-owned inventions covered by U.S. patents and applications for patent. The citations included in *NASA PAB* were originally published in NASA's *Scientific and Technical Aerospace Reports (STAR)* and cover *STAR* announcements made since May 1969.

For the convenience of the user, each issue of *NASA PAB* has a separately bound Abstract Section (Section 1) and Index Section (Section 2). Although each Abstract Section covers only the indicated six-month period, the Index Section is cumulative covering all NASA-owned inventions announced in *STAR* since 1969 Thus a complete set of *NASA PAB* would consist of the Abstract Sections of Issue 04 (January 1974) and Issue 12 (January 1978) and the Abstract Section for all subsequent issues and the Index Section for the most recent issue.

The 129 citations published in this issue of the Abstract Section cover the period January 1983 through June 1983. The Index Section references over 4000 citations covering the period May 1969 through June 1983.

ABSTRACT SECTION (SECTION 1)

This *PAB* issue incorporates the 1975 *STAR* category revisions which include 10 major subdivisions divided into 74 specific categories and one general category/division. (See Table of Contents for the scope note of each category under which are grouped appropriate NASA inventions.) This new scheme was devised in lieu of the 34 category divisions which were utilized in *PAB* supplements (01) through (06) covering *STAR* abstracts from May 1969 through January 1974 Each entry in the Abstract Section consists of a *STAR* citation accompanied by an abstract and a key illustration taken from the patent or application for patent drawing. Entries are arranged in subject category in order of the ascending NASA Accession Number originally assigned in *STAR* to the invention. The range of NASA Accession Numbers within each issue is printed on the inside front cover.

Abstract Citation Data Elements Each of the abstract citations has several data elements useful for identification and indexing purposes, as follows·

NASA Accession Number
NASA Case Number
Inventor's Name
Title of Invention
U.S. Patent Application Serial Number
U.S Patent Number (for issued patents only)
U.S. Patent Office Classification Number(s)
(for issued patents only)

These data elements in the citation of the abstract are depicted in the Typical Citation and Abstract reproduced on the following page and are also used in the indexes.

TYPICAL CITATION AND ABSTRACT

NASA SPONSORED DOCUMENT

AVAILABLE ON MICROFICHE

NASA ACCESSION NUMBER

N83-18025*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va

SOURCE

TITLE

CHALCOGENOPHOSPHATE PHOTOELECTRODES Patent Application

INVENTOR

Benjamin Reichman (Christopher Newport Coll) and Charles E Byvik, inventors (to NASA) Filed 7 Oct. 1982 14 p

US PATENT APPLICATIONS SERIAL NUMBER

NASA CASE NUMBER

(NASA-Case-LAR-12958-1; US-Patent-Appl-SN-433196) Avail:

AVAILABILITY

NTIS HC A02/MF A01 CSCL 10A

COSATI CODE

ABSTRACT

A device for converting light energy into other forms of useful energy such as electrical or chemical energy is described A photoelectrode is manufactured from a layered chalcogenophosphate (MPX3) compound employed in a photoelectrochemical cell where M is selected from the group consisting of the transition metal series of elements beginning with scandium (atomic number 21) through germanium (atomic number 32), yttrium (atomic number 39) through antimony (atomic number 51), and lanthanum (atomic number 57) through polonium (atomic number 84); P is phosphorus; and X is selected from the chalogenide series consisiting of sulfur, selenium, and tellerium The photoelectrochemical cell is comprised of a container which retains an acidic electrolyte solution, an MPX3 photoelectrode, and a counterelectrode. In the preferred embodiment, the photoelectrochemical cell is set up as a photoelectrolysis cell

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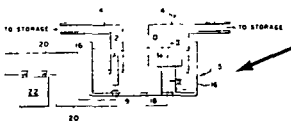
KEY ILLUSTRATION



INDEX SECTION (SECTION 2)

The Index Section is divided into five indexes which are cross-indexed and are useful in locating a single invention or groups of inventions

Each of the five indexes utilizes basic data elements (1) Subject Category Number, (2) NASA Accession Number, and (3) NASA Case Number, in addition to other specific index terms.

Subject Index: Lists all inventions according to appropriate alphabetized technical term and indicates the related NASA Case Number, the Subject Category Number, and the NASA Accession Number.

Inventor Index: Lists all inventions according to alphabetized names of inventors and indicates the related NASA Case Number, the Subject Category Number, and the NASA Accession Number.

Source Index: Lists all inventions according to alphabetized source of invention (i.e., name of contractor or government installation where invention was made) and indicates the related NASA Case Number, the Subject Category Number, and the NASA Accession Number

Number Index: Lists inventions in order of ascending (1) NASA Case Number, (2) U.S. Patent Application Serial Number, (3) U.S Patent Classification Number, and (4) U.S Patent Number and indicates the related Subject Category Number and the NASA Accession Number

Accession Number Index: Lists all inventions in order of ascending NASA Accession Number and indicates the related Subject Category Number, the NASA Case Number, the U.S. Patent Application Serial Number, the U.S. Patent Classification Number, and the U S. Patent Number

HOW TO USE THIS PUBLICATION TO IDENTIFY NASA INVENTIONS

To identify one or more NASA inventions within a specific technical field or subject, several techniques are possible when using the flexibility incorporated into the *NASA PAB.*

(1) *Using Subject Category:* To identify all NASA inventions in any one of the subject categories in this issue of *NASA PAB,* select the desired Subject Category in the Abstract Section (Section 1) and find the inventions abstracted thereunder.

(2) *Using Subject Index:* To identify all NASA inventions listed under a desired technical subject index term, (A) turn to the cumulative Subject Index in the Index Section and find the invention(s) listed under the desired technical subject term. (B) Note the indicated Accession Number and the Subject Category Number. (C) Using the indicated Accession Number, turn to the inside front cover of the Index Section to determine which issue of the Abstract Section includes the Accession Number desired (D) To find the abstract of the particular invention in the issue of the Abstract Section selected, (i) use the Subject Category Number to locate the Subject Category and (ii) use the Accession Number to locate the desired invention within the Subject Category listing.

(3) *Using Patent Classification Index:* To identify all inventions covered by issued NASA patents (does not include applications for patent) within a desired Patent Classification, (A) turn to the Patent Classification Number in the Number Index of Section 2 and find the associated invention(s), and (B) follow the instructions outlined in (2)(B), and (D) above.

PUBLIC AVAILABILITY OF COPIES OF PATENTS AND PATENT APPLICATIONS

Copies of U.S. patents may be purchased directly from the U.S. Patent and Trademark Office, Washington, D.C. 20231, for fifty cents a copy. When ordering patents, the U.S. Patent Number should be used, and payment must be remitted in advance, preferably by money order or check payable to the Commissioner of Patents and Trademarks. Prepaid purchase coupons for ordering are also available from the Patent and Trademark Office.

NASA *patent application specifications* are sold in paper copy by the National Technical Information Service at price code A02 ($7.00 domestic; $14.00 foreign). Microfiche are sold at price code A01 ($4.50 domestic; $9.00 foreign). The US-Patent-Appl-SN-number should be used in ordering either paper copy or microfiche from NTIS.

LICENSES FOR COMMERCIAL USE: INQUIRIES AND APPLICATIONS FOR LICENSE

NASA inventions, abstracted in *NASA PAB,* are available for nonexclusive or exclusive licensing in accordance with the NASA Patent Licensing Regulations. It is significant that all licenses for NASA inventions shall be by express written instruments and that no license will be granted or implied in a NASA invention except as provided in the NASA Patent Licensing Regulations.

Inquiries concerning the NASA Patent Licensing Program or the availability of licenses for the commercial use of NASA-owned inventions covered by U.S. patents or pending applications for patent should be forwarded to the NASA Patent Counsel of the NASA installation having cognizance of the specific invention, or the Assistant General Counsel for Patent Matters, Code GP-4, National Aeronautics and Space Administration, Washington, D.C. 20546. Inquiries should refer to the NASA Case Number, the Title of the Invention, and the U.S. Patent Number or the U.S. Application Serial Number assigned to the invention as shown in *NASA PAB.*

The NASA Patent Counsel having cognizance of the invention is determined by the first three letters or prefix of the NASA Case Number assigned to the invention. The addresses of NASA Patent Counsels are listed alongside the NASA Case Number prefix letters in the following table. Formal application of license must be submitted on the NASA Form, Application for NASA Patent License, which is available upon request from any NASA Patent Counsel.

NASA Case Number Prefix Letters	Address of Cognizant NASA Patent Counsel
ARC-xxxxx XAR-xxxxx	Ames Research Center Mail Code: 200-11A Moffett Field, California 94035 Telephone: (415)965-5104
ERC-xxxxx XER-xxxxx HQN-xxxxx XHQ-xxxxx	NASA Headquarters Mail Code: GP-4 Washington, D.C. 20546 Telephone: (202)755-3954
GSC-xxxxx XGS-xxxxx	Goddard Space Flight Center Mail Code: 204 Greenbelt, Maryland 20771 Telephone: (301)344-7351
KSC-xxxxx XKS-xxxxx	John F. Kennedy Space Center Mail Code: PT-PAT Kennedy Space Center, Florida 32899 Telephone: (305)867-2544
LAR-xxxxx XLA-xxxxx	Langley Research Center Mail Code: 279 Hampton, Virginia 23365 Telephone: (804)827-8725
LEW-xxxxx XLE-xxxxx	Lewis Research Center Mail Code: 500-318 21000 Brookpark Road Cleveland, Ohio 44135 Telephone: (216)433-6346
MSC-xxxxx XMS-xxxxx	Lyndon B. Johnson Space Center Mail Code: AL3 Houston, Texas 77058 Telephone: (713)483-4871
MFS-xxxxx XMF-xxxxx	George C. Marshall Space Flight Center Mail Code: CC01 Huntsville, Alabama 35812 Telephone: (205)453-0020
NPO-xxxxx XNP-xxxxx FRC-xxxxx XFR-xxxxx WOO-xxxxx	NASA Resident Legal Office Mail Code: 180-801 4800 Oak Grove Drive Pasadena, California 91103 Telephone: (213)354-2700

PATENT LICENSING REGULATIONS

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

14 CFR Part 1245

Licensing of NASA Inventions

AGENCY: National Aeronautics and Space Administration.

ACTION: Interim regulation with comments requested.

SUMMARY: The National Aeronautics and Space Administration (NASA) is revising its patent licensing regulations to conform with Pub L. 96-517. This interim regulation provides policies and procedures applicable to the licensing of federally owned inventions in the custody of the National Aeronautics and Space Administration, and implements Pub L. 96-517. The object of this subpart is to use the patent system to promote the utilization of inventions arising from NASA supported research and development.

EFFECTIVE DATE: July 1, 1981. Comments must be received in writing by December 2, 1981. Unless a notice is published in the **Federal Register** after the comment period indicating changes to be made, this interim regulation shall become a final regulation.

ADDRESS: Mr. John G. Mannix, Director of Patent Licensing, GP-4, NASA, Washington, D.C. 20546.

FOR FURTHER INFORMATION CONTACT:
Mr John G. Mannix, (202) 755-3954.

SUPPLEMENTARY INFORMATION:

PART 1245—PATENTS AND OTHER INTELLECTUAL PROPERTY RIGHTS

Subpart 2 of Part 1245 is revised to read as follows:

* * * * *

Subpart 2—Licensing of NASA Inventions

Sec

Authority: 35 U.S.C. Section 207 and 208, 94 Stat 3023 and 3024

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Subpart 2—Licensing of NASA Inventions

§ 1245.200 Scope of subpart.

This subpart prescribes the terms, conditions, and procedures upon which a NASA invention may be licensed. It does not affect licenses which (a) were in effect prior to July 1, 1981; (b) may exist at the time of the Government's acquisition of title to the invention, including those resulting from the allocation of rights to inventions made under Government research and development contracts, (c) are the result of an authorized exchange of rights in the settlement of patent disputes; or (d) are otherwise authorized by law or treaty.

§ 1245.201 Policy and objective.

It is the policy and objective of this subpart to use the patent system to promote the utilization of inventions arising from NASA supported research and development.

§ 1245.202 Definitions.

(a) "Federally owned invention" means an invention, plant, or design which is covered by a patent, or patent application in the United States, or a patent, patent application, plant variety protection, or other form of protection, in a foreign country, title to which has been assigned to or otherwise vested in the United States Government.

(b) "Federal agency" means an executive department, military department, Government corporation, or independent establishment, except the Tennessee Valley Authority, which has custody of a Federally owned invention.

(c) "NASA Invention" means a Federally owned invention with respect to which NASA maintains custody and administration, in whole or in part, of the right, title or interest in such invention on behalf of the United States Government

(d) "Small business firm" means a small business concern as defined at section 2 of Pub. L. 85-536 (15 U.S.C. 632) and implementing regulations of the Administrator of the Small Business Administration. For the purpose of these regulations, the size standard for small business concerns involved in Government procurement, contained in 13 CFR 121.3-8, and in subcontracting, contained in 13 CFR 121.3-12, will be used

(e) Practical application" means to manufacture in the case of a composition or product, to practice in the case of a process or method, or to operate in the case of a machine or system; and, in each case, under such conditions as to establish that the invention is being utilized and that its benefits are to the extent permitted by law or Government regulations available to the public on reasonable terms.

(f) "United States" means the United States of America, its territories and possessions, the District of Columbia, and the Commonwealth of Puerto Rico.

§ 1245.203 Authority to grant licenses.

NASA inventions shall be made available for licensing as deemed appropriate in the public interest. NASA may grant nonexclusive, partially exclusive, or exclusive licenses thereto under this subpart on inventions in its custody.

Restrictions and Conditions

§ 1245.204 All licenses granted under this subpart.

(a) *Restrictions.* (1) A license may be granted only if the applicant has supplied NASA with a satisfactory plan for development or marketing of the invention, or both, and with information about the applicant's capability to fulfill the plan.

(2) A license granting rights to use or sell under a NASA invention in the United States shall normally be granted only to a licensee who agrees that any products embodying the invention or produced through the use of the invention will be manufactured substantially in the United States.

(b) *Conditions* Licenses shall contain such terms and conditions as NASA determines are appropriate for the protection of the interests of the Federal Government and the public and are not in conflict with law or this subpart. The following terms and conditions apply to any license:

(1) The duration of the license shall be for a period specified in the license agreement, unless sooner terminated in accordance with this subpart.

(2) The license may be granted for all or less than all fields of use of the invention or in specified geographical areas, or both.

(3) The license may extend to subsidiaries of the licensee or other parties if provided for in the license but shall be nonassignable without approval of NASA, except to the successor of that part of the licensee's business to which the invention pertains.

(4) The license may provide the licensee the right to grant sublicenses under the license, subject to the approval of NASA. Each sublicense shall make reference to the license, including the rights retained by the Government, and a copy of such

sublicense shall be furnished to NASA.

(5) The license shall require the licensee to carry out the plan for development or marketing of the invention, or both, to bring the invention to practical application within a period specified in the license, and to continue to make the benefits of the invention reasonably accessible to the public.

(6) The license shall require the licensee to report periodically on the utilization or efforts at obtaining utilization that are being made by the licensee, with particular reference to the plan submitted.

(7) All licenses shall normally require royalties or other consideration.

(8) Where an agreement is obtained pursuant to § 1245.204(a)(2) that any products embodying the invention or produced through use of the invention will be manufactured substantially in the United States, the license shall recite such agreement.

(9) The license shall provide for the right of NASA to terminate the license, in whole or in part, if:

(i) NASA determines that the licensee is not executing the plan submitted with its request for a license and the licensee cannot otherwise demonstrate to the satisfaction of NASA that it has taken or can be expected to take within a reasonable time effective steps to achieve practical application of the invention;

(ii) NASA determines that such action is necessary to meet requirements for public use specified by Federal regulations issued after the date of the license and such requirements are not reasonably satisfied by the licensee;

(iii) The licensee has willfully made a false statement of or willfully omitted a material fact in the license application or in any report required by the license agreement; or

(iv) The licensee commits a substantial breach of a covenant or agreement contained in the license.

(10) The license may be modified or terminated, consistent with this subpart, upon mutual agreement of NASA and the licensee.

(11) Nothing relating to the grant of a license, nor the grant itself, shall be construed to confer upon any person any immunity from or defenses under the antitrust laws or from a charge of patent misuse, and the acquisition and use of rights pursuant to this subpart shall not be immunized from the operation of state or Federal law by reason of the source of the grant.

Types of Licenses

§ 1245.205 Nonexclusive licenses.

(a) *Availability of licenses.* Nonexclusive licenses may be granted under NASA inventions without publication of availability or notice of a prospective license.

(b) *Conditions.* In addition to the provisions of § 1245.204, the nonexclusive license may also provide that, after termination of a period specified in the license agreement, NASA may restrict the license to the fields of use or geographic areas, or both, in which the licensee has brought the invention to practical application and continues to make the benefits of the invention reasonably accessible to the public. However, such restriction shall be made only in order to grant an exclusive or partially exclusive license in accordance with this subpart.

§ 1245.206 Exclusive and partially exclusive licenses.

(a) Domestic licenses.

(1) *Availability of licenses.* Exclusive or partially exclusive licenses may be granted on NASA inventions: (i) 3 months after notice of the invention's availability has been announced in the **Federal Register;** or (ii) without such notice where NASA determines that expeditious granting of such a license will best serve the interests of the Federal Government and the public; and (iii) in either situation, specified in (a)(1)(i) or (ii) of this section only if:

(A) Notice of a prospective license, identifying the invention and the prospective licensee, has been published in the **Federal Register,** providing opportunity for filing written objections within a 60-day period;

(B) After expiration of the period in § 1245.206(a) (1)(iii)(A) and consideration of nay written objections received during the period, NASA has determined that:

(*1*) The interests of the Federal Government and the public will best be served by the proposed license, in view of the applicant's intentions, plans, and ability to bring the invention to practical application or otherwise promote the invention's utilization by the public;

(*2*) The desired practial application has not been achieved, or is not likely expeditiously to be achieved, under any nonexclusive license which has been granted, or which may be granted, on the invention;

(*3*) Exclusive or partially exclusive licensing is a reasonable and necessary incentive to call forth the investment of risk capital and expenditures to bring the invention to practical application or otherwise promote the invention's utilization by the public; and

(*4*) The proposed terms and scope of exclusivity are not greater than reasonably necessary to provide the incentive for bringing the invention to practical application or otherwise promote the invention's utilization by the public;

(C) NASA has not determined that the grant of such license will tend substantially to lessen competition or result in undue concentration in any section of the country in any line of commerce to which the technology to be licensed relates, or to create or maintain other situations inconsistent with the antitrust laws; and

(D) NASA has given first preference to any small business firms submitting plans that are determined by the agency to be within the capabilities of the firms and as equally likely, if executed, to bring the invention to practical application as any plans submitted by applicants that are not small business firms.

(2) *Conditions.* In addition to the provisions of § 1245.204, the following terms and conditions apply to domestic exclusive and partially exclusive licenses:

(i) The license shall be subject to the irrevocable, royalty-free right of the Government of the United States to practice and have practiced the invention on behalf of the United States and on behalf of any foreign government or international organization pursuant to any existing or future treaty or agreement with the United States.

(ii) The license shall reserve to NASA the right to require the licensee to grant sublicenses to responsible applicants, on reasonable terms, when necessary to fulfill health or safety needs.

(iii) The license shall be subject to any licenses in force at the time of the grant of the exclusive or partially exclusive license.

(iv) The license may grant the licensee the right of enforcement of the licensed patent pursuant to the provisions of Chapter 29 of Title 35, United States Code, or other statutes, as determined appropriate in the public interest.

(b) Foreign licenses.

(1) *Availability of licenses.* Exclusive or partially exclusive licenses may be granted on a NASA invention covered by a foreign patent, patent application, or other form of protection, provided that:

(i) Notice of a prospective license, identifying the invention and prospective licensee, has been published in the **Federal Register,** providing opportunity for filing written objections

within a 60-day period and following consideration of such objections;

(ii) NASA has considered whether the interests of the Federal Government or United States industry in foreign commerce will be enhanced; and

(iii) NASA has not determined that the grant of such license will tend substantially to lessen competition or result in undue concentration in any section of the United States in any line of commerce to which the technology to be licensed relates, or to create or maintain other situations inconsistent with antitrust laws.

(2) *Conditions.* In addition to the provisions of § 1245.204, the following terms and conditions apply to foreign exclusive and partially exclusive licenses:

(i) The license shall be subject to the irrevocable, royalty-free right of the Government of the United States to practice and have practiced the invention on behalf of the United States and on behalf of any foreign government or international organization pursuant to any existing or future treaty or agreement with the United States.

(ii) The license shall be subject to any licenses in force at the time of the grant of the exclusive or partially exclusive license.

(iii) The license may grant the licensee the right to take any suitable and necessary actions to protect the licensed property, on behalf of the Federal Government.

(c) *Record of determinations.* NASA shall maintain a record of determinations to grant exclusive or partially exclusive licenses.

Procedures

§ 1245.207 Application for a license.

An application for a license should be addressed to the Patent Counsel at the NASA installation having responsibility for the invention and shall normally include:

(a) Identification of the invention for which the license is desired, including the patent application serial number or patent number, title, and date, if known;

(b) Identification of the type of license for which the application is submitted;

(c) Name and address of the person, company, or organization applying for the license and the citizenship or place of incorporation of the applicant;

(d) Name, address, and telephone number of representative of applicant to whom correspondence should be sent;

(e) Nature and type of applicant's business, identifying products or services which the applicant has successfully commercialized, and approximate number of applicant's employees;

(f) Source of information concerning the availability of a license on the invention;

(g) A statement indicating whether applicant is a small business firm as defined in § 1245.202(c);

(h) A detailed description of applicant's plan for development or marketing of the invention, or both, which should include:

(1) A statement of the time, nature and amount of anticipated investment of capital and other resources which applicant believes will be required to bring the invention to practical application;

(2) A statement as to applicant's capability and intention to fulfill the plan, including information regarding manufacturing, marketing, financial, and technical resources;

(3) A statement of the fields of use for which applicant intends to practice the invention; and

(4) A statement of the geographic areas in which applicant intends to manufacture any products embodying the invention and geographic areas where applicant intends to use or sell the invention, or both;

(i) Identification of licenses previously granted to applicant under Federally owned inventions;

(j) A statement containing applicant's best knowledge of the extent to which the invention is being practiced by private industry or Government, or both, or is otherwise available commercially; and

(k) Any other information which applicant believes will support a determination to grant the license to applicant.

§ 1245.208 Processing applications.

(a) Applications for licenses will be initially reviewed by the Patent Counsel of the NASA installation having responsibility for the invention. The Patent Counsel shall make a preliminary recommendation to the Director of Licensing, NASA Headquarters, whether to: (1) grant the license as requested, (2) grant the license with modification after negotiation with the licensee, or (3) deny the license. The Director of Licensing shall review the preliminary recommendation of the Patent Counsel and make a final recommendation to the NASA Assistant General Counsel for Patent Matters. Such review and final recommendation may include, and be based on, any additional information obtained from applicant and other sources that the Patent Counsel and the Director of Licensing deem relevant to the license requested. The determination to grant or deny the license shall be made by the Assistant General Counsel for Patent Matters based on the final recommendation of the Director of Licensing.

(b) When notice of a prospective exclusive or partially exclusive license is published in the Federal Register in accordance with § 1245.206(a)(1)(iii)(A) or § 1245.206(b)(1)(i), any written objections received in response thereto will be considered by the Director of Licensing in making the final recommendation to the Assistant General Counsel for Patent Matters.

(c) If the requested license, including any negotiated modifications, is denied by the Assistant General Counsel for Patent Matters, the applicant may request reconsideration by filing a written request for reconsideration within 30 days after receiving notice of denial. This 30-day period may be extended for good cause.

(d) In addition to, or in lieu of requesting reconsideration, the applicant may also appeal the denial of the license in accordance with § 1245.211.

§ 1245.209 Notice to Attorney General.

A copy of the notice provided for in §§ 1245.206(a)(1)(iii)(A), and 1245.206(b)(1)(i) will be sent to the Attorney General.

§ 1245.210 Modification and termination of licenses.

Before modifying or terminating a license, other than by mutual agreement, NASA shall furnish the licensee and any sublicensee of record a written notice of intention to modify or terminate the license, and the licensee and any sublicensee shall be allowed 30 days after such notice to remedy any breach of the license or show cause why the license should not be modified or terminated.

§ 1245.211 Appeals.

(a) The following parties may appeal to the NASA Administrator or designee any decision or determination concerning the grant, denial, interpretation, modification, or termination of a license:

(1) A person whose application for a license has been denied;

(2) A licensee whose license has been modified or terminated, in whole or in part; or

(3) A person who timely filed a written objection in response to the notice required by §§ 1245.206(a)(1)(iii)(A) or

1245.206(b)(1)(i) and who can demonstrate to the satisfaction of NASA that such person may be damaged by the Agency action.

(b) Written notice of appeal must be filed within 30 days (or such other time as may be authorized for good cause shown) after receiving notice of the adverse decision or determination; including, an adverse decision following the request for reconsideration under § 1245.208(c). The notice of appeal, along with all supporting documentation should be addressed to the Administrator, National Aeronautics and Space Administration, Washington. DC 20546. Should the appeal raise a genuine dispute over material facts, fact-finding will be conducted by the NASA Inventions and Contributions Board. The person filing the appeal shall be afforded an opportunity to be heard and to offer evidence in support of the appeal. The Chairperson of the Inventions and Contributions Board shall prepare written findings of fact and transmit them to the Administrator or designee. The decision on the appeal shall be made by the NASA Administrator or designee. There is no further right of administrative appeal from the decision of the Administrator or designee.

§ 1245.212 Protection and administration of inventions.

NASA may take any suitable and necessary steps to protect and administer rights to NASA inventions, either directly or through contract.

§ 1245.213 Transfer of custody.

NASA having custody of certain Federally owned inventions may transfer custody and administration in whole or in part, to another Federal agency, of the right, title, or interest in any such invention.

§ 1245.214 Confidentiality of information.

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James M. Beggs,

Administrator.

October 15, 1981.

[FR Doc. 81-31609 Filed 10-30-81, 8:45 am]

BILLING CODE 7510-01-M

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TABLE OF CONTENTS

Section 1 • Abstracts

AERONAUTICS

Includes aeronautics (general); aerodynamics; air transportation and safety, aircraft communications and navigation, aircraft design, testing and performance, aircraft instrumentation; aircraft propulsion and power; aircraft stability and control; and research and support facilities (air)

For related information see also *Astronautics*

ASTRONAUTICS

Includes astronautics (general), astrodynamics; ground support systems and facilities (space); launch vehicles and space vehicles; space transportation; spacecraft communications, command and tracking; spacecraft design, testing and performance; spacecraft instrumentation, and spacecraft propulsion and power.

For related information see also *Aeronautics*

CHEMISTRY AND MATERIALS

Includes chemistry and materials (general); composite materials; inorganic and physical chemistry; metallic materials; nonmetallic materials; and propellants and fuels

ENGINEERING

Includes engineering (general); communications; electronics and electrical engineering; fluid mechanics and heat transfer, instrumentation and photography, lasers and masers; mechanical engineering; quality assurance and reliability; and structural mechanics
For related information see also *Physics*

GEOSCIENCES

Includes geosciences (general), earth resources, energy production and conversion, environment pollution, geophysics; meteorology and climatology; and oceanography
For related information see also *Space Sciences*

LIFE SCIENCES

Includes sciences (general); aerospace medicine; behavioral sciences; man/system technology and life support; and planetary biology.

MATHEMATICAL AND COMPUTER SCIENCES

Includes mathematical and computer sciences (general); computer operations and hardware; computer programming and software; computer systems; cybernetics; numerical analysis; statistics and probability; systems analysis; and theoretical mathematics.

PHYSICS

Includes physics (general); acoustics; atomic and molecular physics; nuclear and high-energy physics; optics; plasma physics; solid-state physics; and thermodynamics and statistical physics.
For related information see also *Engineering.*

SOCIAL SCIENCES

Includes social sciences (general); administration and management; documentation and information science; economics and cost analysis; law and political science; and urban technology and transportation.

82 DOCUMENTATION AND INFORMATION SCIENCE **N.A.**

Includes information storage and retrieval technology, micrography, and library science

For computer documentation see *61 Computer Programming and Software*

83 ECONOMICS AND COST ANALYSIS **N.A.**

Includes cost effectiveness studies

84 LAW AND POLITICAL SCIENCE **N.A.**

Includes space law, international law, international cooperation; and patent policy

85 URBAN TECHNOLOGY AND TRANSPORTATION **N.A.**

Includes applications of space technology to urban problems, technology transfer; technology assessment, and surface and mass transportation

For related information see *03 Air Transportation and Safety, 16 Space Transportation,* and *44 Energy Production and Conversion*

SPACE SCIENCES

Includes space sciences (general); astronomy, astrophysics; lunar and planetary exploration; solar physics, and space radiation

For related information see also *Geosciences*

88 SPACE SCIENCES (GENERAL) **N.A.**

89 ASTRONOMY **N.A.**

Includes radio and gamma-ray astronomy, celestial mechanics, and astrometry

90 ASTROPHYSICS **N.A.**

Includes cosmology; and interstellar and interplanetary gases and dust

91 LUNAR AND PLANETARY EXPLORATION **N.A.**

Includes planetology, and manned and unmanned flights

For spacecraft design see *18 Spacecraft Design, Testing and Performance* For space stations see *15 Launch Vehicles and Space Vehicles*

92 SOLAR PHYSICS **N.A.**

Includes solar activity, solar flares, solar radiation and sunspots

93 SPACE RADIATION **N.A.**

Includes cosmic radiation, and inner and outer earth's radiation belts.

For biological effects of radiation see *52 Aerospace Medicine* For theory see *73 Nuclear and High-Energy Physics*

GENERAL

99 GENERAL **N.A.**

Note: N.A. means that no abstracts were assigned to this category for this issue.

Section 2 • Indexes

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NASA Patent Abstracts Bibliography

A Semiannual Publication of the National Aeronautics and Space Administration

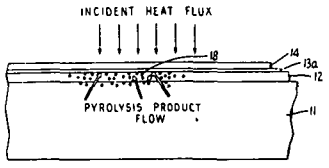
03 AIR TRANSPORTATION AND SAFETY

Includes passenger and cargo air transport operations; and aircraft accidents.

For related information see also *16 Space Transportation* and *85 Urban Technology and Transportation.*

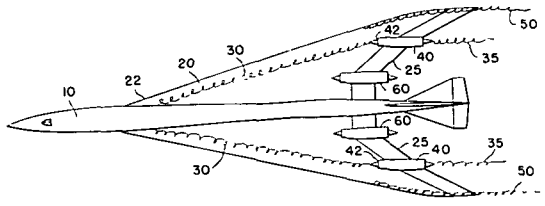
N83-17525*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
FIRE BLOCKING SYSTEMS FOR AIRCRAFT SEAT CUSHIONS Patent Application
John A. Parker and Demetrius A. Kourtides, inventors (to NASA) Filed 23 Dec. 1982 22 p
(NASA-Case-ARC-11423-1; US-Patent-Appl-SN-452466) Avail: NTIS HC A02/MF A01 CSCL 01C

A system for fire blocking in aircraft cushions by minimizing release of flammable gaseous decomposition products is disclosed. The system employs a catalytic matrix which cracks the flammable gaseous decomposition products to less flammable species. The system uses a non-fire retarded polyurethane cushion surrounded by an aramid matrix which is in turn covered with an aluminum film, e.g., aluminized Norfab 11 HT-26-AL. This matrix can be used alone or in combination with one or more additional coverings which enhance the contact of the combustible vapors with the catalytic matrix. These catalytic matrix materials are relatively light weight and permit a reasonably priced final product. The role of aluminum film is two fold: first it serves as a delocalizing heat conductor; and second, it provides a vapor barrier to increase the residence time of gases in the fabric thereby enhancing pryolysis and char-layer formation. NASA



N83-19730# National Bureau of Standards, Washington, D.C. National Engineering Lab.
AN ASSESSMENT OF CORRELATIONS BETWEEN LABORATORY AND FULL-SCALE EXPERIMENTS FOR THE FAA AIRCRAFT FIRE SAFETY PROGRAM. PART 5: SOME ANALYSES OF THE POST CRASH FIRE SCENARIO
James G. Quintiere and Takeyoshi Tanaka (Building Research Inst.) Atlantic City, N.J. FAA Jul. 1982 27 p refs 5 Vol.
(PB83-113555; NBSIR-82-2537-Pt-5; DOT/FAA/CT-82/107-Pt-5) Avail: NTIS HC A03/MF A01 CSCL 01C

An attempt is made to develop mathematical predictions for various aspects of the dynamics of post-crash aircraft fires. The basis of the analysis is the experimental simulation scenario under study by the FAA. The effects of wind are considered as well as the effect of interior and exterior fires. Suggestions are presented for estimating cabin door flow rates from measured temperatures. Author (GRA)



05 AIRCRAFT DESIGN, TESTING AND PERFORMANCE

Includes aircraft simulation technology.

For related information see also *18 Spacecraft Design, Testing and Performance* and *39 Structural Mechanics*

N83-19737* National Aeronautics and Space Administration. Hugh L. Dryden Flight Research Center, Edwards, Calif.
AIRCRAFT CANOPY LOCK Patent
George H. Nichols, inventor (to NASA) Issued 30 Mar. 1981 6 p Filed 30 Mar. 1981 Supersedes N81-24047 (19 - 15, p 2007)
(NASA-Case-FRC-11065-1; US-Patent-4,375,281; US-Patent-Appl-SN-248744; US-Patent-Case-244-121; US-Patent-Case-244-129.4; US-Patent-Case-292/254) Avail: US Patent and Trademark Office CSCL 01C

A manually-operable lock for releasably securing a canopy in closed condition is described.

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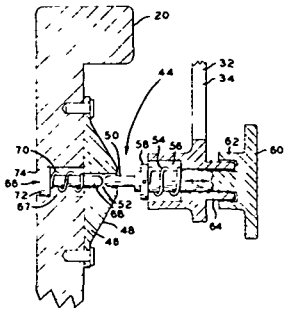

06 AIRCRAFT INSTRUMENTATION

Includes cockpit and cabin display devices; and flight instruments.

For related information see also *19 Spacecraft Instrumentation* and *35 Instrumentation and Photography.*

N83-10040* National Aeronautics and Space Administration. Pasadena Office, Calif.

CAT ALTITUDE AVOIDANCE SYSTEM Patent

Bruce L. Gary, inventor (to NASA) (JPL, California Inst. of Technology, Pasadena) Issued 31 Aug. 1982 23 p Filed 12 Jan. 1981 Supersedes N81-16677 (19 - 07, p 0947) Sponsored by NASA

(NASA-Case-NPO-15351-1; US-Patent-4,346,595; US-Patent-Appl-SN-224231; US-Patent-Class-73-178R; US-Patent-Class-73-170R; US-Patent-Class-343-100ME; US-Patent-Class-374-122; US-Patent-Class-374-123) Avail: US Patent and Trademark Office CSCL 01D

A method and apparatus are provided for indicating the altitude of the tropopause or of an inversion layer wherein clear air turbulence (CAT) may occur, and the likely severity of any such CAT, includes directing a passive microwave radiometer on the aircraft at different angles with respect to the horizon. The microwave radiation measured at a frequency of about 55 GHz represents the temperature of the air at an "average" range of about 3 kilometers, so that the sine of the angle of the radiometer times 3 kilometers equals the approximate altitude of the air whose temperature is measured. A plot of altitude (with respect to the aircraft) versus temperature of the air at that altitude, can indicate when an inversion layer is present and can indicate the altitude of the tropopause or of such an inversion layer. The plot can also indicate the severity of any CAT in an inversion layer. If CAT has been detected in the general area, then the aircraft can be flown at an altitude to avoid the tropopause or inversion layer.

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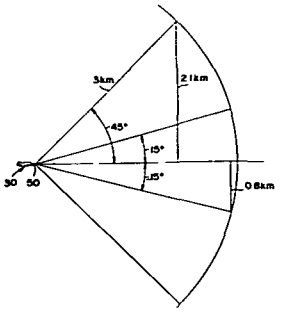


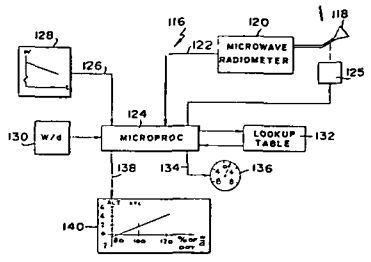
N83-17536*# National Aeronautics and Space Administration. Pasadena Office, Calif.

SYSTEM FOR INDICATING FUEL-EFFICIENT AIRCRAFT ALTITUDE Patent Application

Bruce L. Gary, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) Filed 26 Aug. 1982 19 p Sponsored by NASA

(NASA-Case-NPO-15351-2; US-Patent-Appl-SN-412039) Avail: NTIS HC A02/MF A01 CSCL 01D

A method and apparatus are provided for indicating the altitude at which an aircraft should fly so the W/d ratio (weight of the aircraft divided by the density of air) more closely approaches the optimum W/d for the aircraft. A passive microwave radiometer on the aircraft is directed at different angles with respect to the horizon, to determine the air temperature and therefore the density of the air, at different altitudes. The weight of the aircraft is known. The altitude of the aircraft is changed to fly the aircraft at an altitude at which its W/d ratio more closely approaches the optimum W/d ratio for that aircraft. NASA



07 AIRCRAFT PROPULSION AND POWER

Includes prime propulsion systems and systems components, e.g., gas turbine engines and compressors; and on-board auxiliary power plants for aircraft.

For related information see also *20 Spacecraft Propulsion and Power, 28 Propellants and Fuels,* and *44 Energy Production and Conversion.*

N83-14129*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

TIP CAP FOR A ROTOR BLADE Patent Application

William K. Koffel (GE, Cincinnati, Ohio), Eugene N. Tuley (GE, Cincinnati, Ohio), Charles H. Gay, Jr. (GE, Cincinnati, Ohio), Raymond E. Troeger (GE, Cincinnati, Ohio), and Albert P. Sterman, inventors (to NASA) (GE, Cincinnati, Ohio) Filed 20 Mar. 1981 19 p Sponsored by NASA

(NASA-Case-LEW-13654-1; US-Patent-Appl-SN-245571) Avail: NTIS HC A02/MF A01 CSCL 21E

A replaceable tip cap for a rotor blade is disclosed. The tip cap is comprised of a plurality of walls for defining a compartment. The tip cap is attachable to the radially outer end of the rotor blade and may be divided into a plurality of subcompartments. A flow of cooling fluid is introduced through inlet holes in the radially inner wall of the tip cap. The fluid exists through outlet holes in a

sidewall. The tip cap design provides for reduced overheating and increased tip cap life as well as increased wear resistance to reduce the rate of engine efficiency loss. NASA

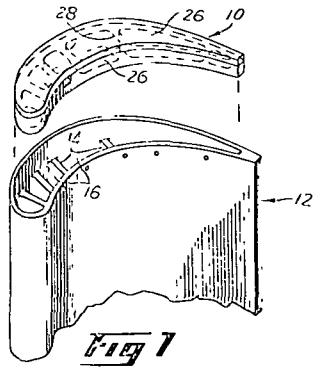
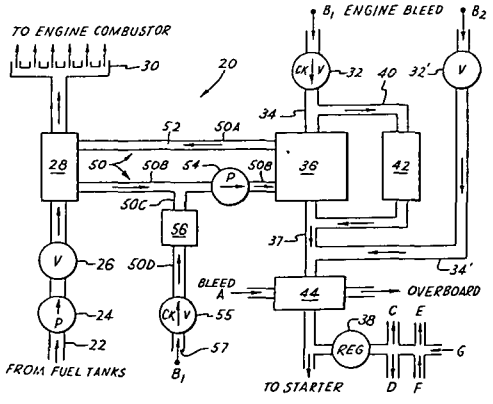


Fig 1

N83-14130*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
APPARATUS AND METHOD FOR IMPROVING THE FUEL EFFICIENCY OF A GAS TURBINE ENGINE Patent Application
George A Coffinberry, inventor (to NASA) (General Electric Co., Cincinnati, Ohio) Filed 20 Mar. 1980 15 p Sponsored by NASA (NASA-Case-LEW-13142-1, US-Patent-Appl-SN-132364) Avail: NTIS HC A02/MF A01 CSCL 21E

An energy recovery system is provided for an aircraft gas turbine engine of the type in which some of the pneumatic energy developed by the engine is made available to support systems such as an environmental control system. In one such energy recovery system, some of the pneumatic energy made available to but not utilized by the support system is utilized to heat the engine fuel immediately prior to the consumption of the fuel by the engine. Some of the recovered energy may also be utilized to heat the fuel in the fuel tanks Provision is made for multiengine applications wherein energy recovered from one engine may be utilized by another one of the engines or systems associated therewith. NASA



N83-20944* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala
ELECTRICAL ROTARY JOINT APPARATUS FOR LARGE SPACE STRUCTURES Patent
Robert R. Belew and Richard J. Boehme, inventors (to NASA) Issued 4 Feb 1981 8 p Filed 4 Feb. 1981 Supersedes N81-19394 (19 - 10 p 1345)
(NASA-Case-MFS-23981-1; US-Patent-4,377,266, US-Patent-Appl-SN-231543; US-Patent-Class-244-159; US-Patent-Class-322-2R; US-Patent-Class-339-5R; US-Patent-Class-339-3R; US-Patent-Class-343-DIG2; US-Patent-Class-244-173) Avail US Patent and Trademark Office CSCL 21E

A structural array and electrical rotary joint for transmitting an electrical power between large space structures having relative rotational movement is disclosed which includes large support framework structures which rotate relative to one another about a common axis of rotation. A rotary interface joint is defined between the structures. A cylindrical hub member is carried by one structure and a cylindrical hub member is carried by a support structure with a third hub member being concentrically within a fourth hub member for relative rotation. Tension connecting cables connect hub members with their associated outer structures whereby relative rotational movement between the structures is transmitted to the cylindrical hub members for unitary motion therewith. Electrical conductor brush members are carried by one hub and electrical contact rings are carried by another hub member in sliding electrical contact with the brushes for transmission of electrical power during relative rotational movement between the two support structures.

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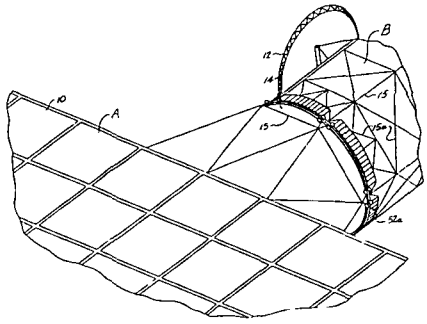
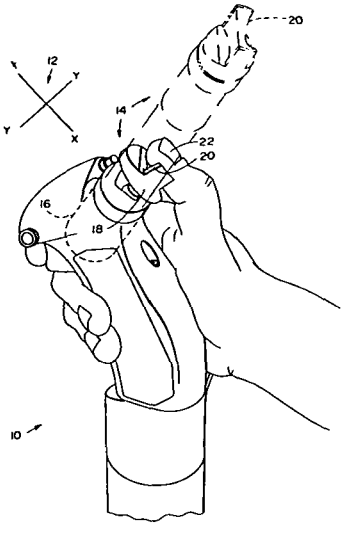


08 AIRCRAFT STABILITY AND CONTROL

Includes aircraft handling qualities, piloting; flight controls; and autopilots.

N83-12098*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
THUMB ACTUATED TWO AXIS CONTROLLER Patent Application
Richard H. Hollow, inventor (to NASA) (Computer Sciences Corp., Mountain View, Calif.) Filed 8 Sep. 1982 19 p Sponsored by NASA
(NASA-Case-ARC-11372-1; US-Patent-Appl-SN-415878) Avail: NTIS HC A02/MF A01 CSCL 01C

A two axis joystick controller is described. It produces at least one output signal in relation to pivotal displacement of a member with respect to an intersection of the two axes. The member is pivotally movable on a support with respect to the two axes. The support has a centrally disposed aperture. A light source is mounted on the pivotally movable member above the aperture to direct light through the aperture. A light sensor is mounted below the aperture in the support at the intersection of the two axes to receive the light from the light source directed through the aperture. The light sensor produces at least one output signal related to a location on the sensor at which the light from the light source strikes the sensor. NASA



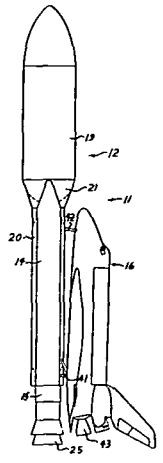
16 SPACE TRANSPORTATION

Includes passenger and cargo space transportation e.g., shuttle operations; and rescue techniques.

For related information see also *03 Air Transportation and Safety* and *85 Urban Technology and Transportation.*

N83-13149*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
SPACE SHUTTLE WITH IMPROVED EXTERNAL PROPELLANT TANK Patent Application
George L. vonPragenau, inventor (to NASA) Filed 15 Sep. 1982 17 p
(NASA-Case-MFS-25853; US-Patent-Appl-SN-418138) Avail: NTIS HC A02/MF A01 CSCL 22B

The configuration and relationship of the external propellant tank and solid rocket boosters of space transportation systems such as the space shuttle are described. The space shuttle system with the improved propellant tank is shown. The external tank has a forward pressure vessel for liquid hydrogen and an aft pressure vessel for liquid oxygen. The solid rocket boosters are joined together by a thrust frame which extends across and behind the external tank. The thrust of the orbiter's main rocket engines are transmitted to the aft portion of the external tank and the thrust of the solid rocket boosters are transmitted to the aft end of the external tank. A modification of the external tank is shown. NASA



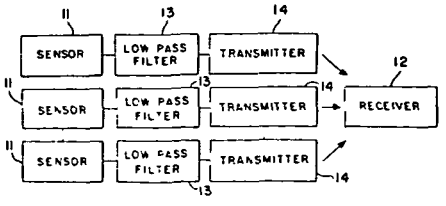
17 SPACECRAFT COMMUNICATIONS, COMMAND AND TRACKING

Includes telemetry; space communications networks; astronavigation; and radio blackout.

For related information see also *04 Aircraft Communications and Navigation* and *32 Communications.*

N83-20995*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
A SINGLE FREQUENCY MULTITRANSMITTER TELEMETRY SYSTEM Patent Application
Victor A. Carreno, inventor (to NASA) Filed 28 Feb. 1983 17 p
(NASA-Case-LAR-13006-1; US-Patent-Appl-SN-470113) Avail: NTIS HC A02/MF A01 CSCL 09D

The invention relates to a single frequency multitransmitter telemetry system that will deliver a substantial amount of data at low cost. The invention consists essentially of a plurality of sensor transmitter units at different locations, with individual signal conditioning and logic, which send sampled data signals to a single receiver. The transmitters operate independently on the same frequency in a frequency shift keying modulation system and are not synchronized to the receiver. The problem of reception of data from more than one transmitter simultaneously is solved by discarding the data - when there is an overlap of data from two or more transmitters, the data is discarded and when there is no overlap the data is retained. The invention utilizes a unique overlap detection technique to determine if data should be retained or discarded. When data is received from a transmitter, it goes into a shift register. NASA



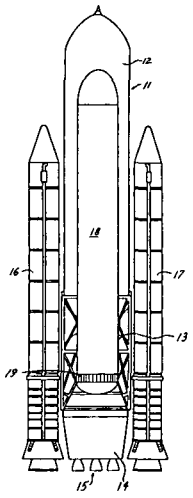
18 SPACECRAFT DESIGN, TESTING AND PERFORMANCE

Includes spacecraft thermal and environmental control; and attitude control.

For life support systems see *54 Man/System Technology and Life Support.* For related information see also *05 Aircraft Design, Testing and Performance* and *39 Structural Mechanics.*

N83-12138*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
THREE STAGE ROCKET VEHICLE WITH PARALLEL STAGING Patent Application
William R. Marshall, inventor (to NASA) Filed 30 Sep. 1982 16 p
(NASA-Case-MFS-25878-1; US-Patent-Appl-SN-431886) Avail: NTIS HC A02/MF A01 CSCL 22B

A three stage rocket vehicle has a large forward propellant tank and a small aft propellant tank axially aligned. Secured to the rear end of the aft propellant tank is an engine mount structure carrying rocket engines. Offset and secured to the propellant tanks is a payload structure. The propellants from the large forward tank are fed into the aft propellant tank and the rocket engines are fed propellants from the aft propellant tank. This arrangement enables the vehicle to parallel stage its use of engines and components and results in significant payload capability. The design and components fully utilize existing space shuttle elements and tooling. NASA



N83-20996* National Aeronautics and Space Administration Lewis Research Center, Cleveland, Ohio.
LASER SURFACE FUSION OF PLASMA SPRAYED CERAMIC TURBINE SEALS Patent
Donald W. Wisander and Robert C. Bill, inventors (to NASA) Issued 11 Mar. 1981 5 p Filed 11 Mar. 1981 Supersedes N81-22190 (19 - 13, p 1739)
(NASA-Case-LEW-13269-1; US-Patent-4,377,371; US-Patent-Appl-SN-242795; US-Patent-Class-415-174; US-Patent-Class-415-197) Avail. US Patent and Trademark Office CSCL 22B

The thermal shock resistance of a ceramic layer is improved. An improved abradable lining that is deposited on a shroud forming a gas path seal in turbomachinery is emphasized. Improved thermal shock resistance of a shroud is effective through the deliberate introduction of 'benign' cracks. These are microcracks which will not propagate appreciably upon exposure to the thermal shock environment in which a turbine seal must function. Laser surface fusion treatment is used to introduce these microcracks. The ceramic surface is laser scanned to form a continuous dense layer. As this cools and solidifies, shrinkage results in the formation of a very fine crack network. The presence of this deliberately introduced fine crack network precludes the formation of a catastrophic crack during thermal shock exposure
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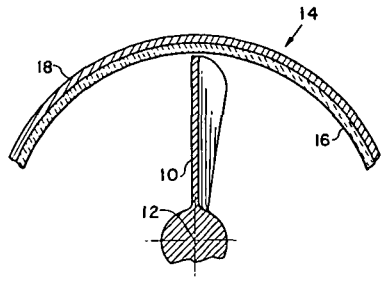


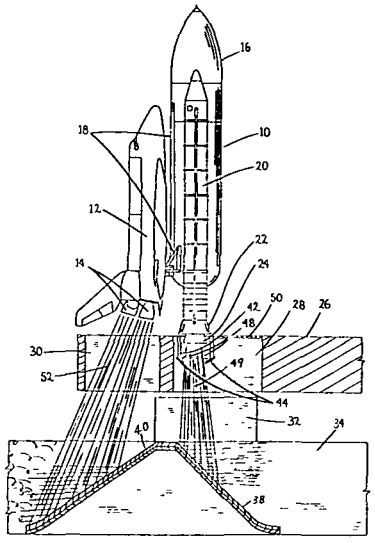
23 CHEMISTRY AND MATERIALS (GENERAL)

Includes biochemistry and organic chemistry.

N83-17588*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
METHOD AND APPARATUS FOR SUPPRESSING IGNITION OVERPRESSURE IN SOLID ROCKET PROPULSION SYSTEMS Patent Application
Stanley H. Guest and Jess H. Jones, inventors (to NASA) Filed 24 Nov. 1982 15 p
(NASA-Case-MFS-25843-1; US-Patent-Appl-SN-444125) Avail: NTIS HC A02/MF A01 CSCL 21H

The transient overpressure wave produced upon ignition of a solid rocket booster is suppressed by providing within the launch platform, a plurality of pipes and spray heads disposed around the periphery of the exhaust gas plume near its upper end and

spraying water into the upper end of the plume during ignition. A large amount of water, preferably equivalent in mass of exhaust products being ejected, is sprayed into the plume in a direction generally perpendicular to plume flow. NASA



24 COMPOSITE MATERIALS

Includes laminates.

N83-10117* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
ION SPUTTER TEXTURED GRAPHITE Patent
James S. Sovey, Ralph Forman, Arthur N. Curren, and Edwin G. Wintucky, inventors (to NASA) Issued 15 May 1981 7 p Filed 15 May 1981 Supersedes N81-27198 (19 - 18, p 2448)
(NASA-Case-LEW-12919-1; US-Patent-4,349,424;
US-Patent-Appl-SN-264378; US-Patent-Class-204-192E;
US-Patent-Class-313-106; US-Patent-Class-313-107;
US-Patent-Class-315-5.38) Avail: US Patent and Trademark Office CSCL 11D

A specially textured surface of pyrolytic graphite exhibits extremely low yields of secondary electrons and reduced numbers of reflected primary electrons after impingement of high energy primary electrons. An ion flux having an energy between 500 eV and 1000 eV and a current density between 1.0 mA/sq cm and 6.0 mA/sq cm produces surface roughening or texturing which is in the form of needles or spines. Such textured surfaces are especially useful as anode collector plates in high efficiency electron tube devices.

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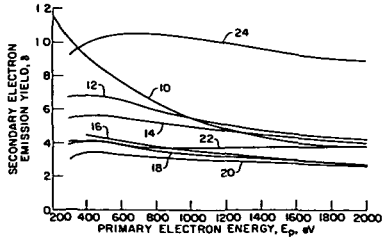
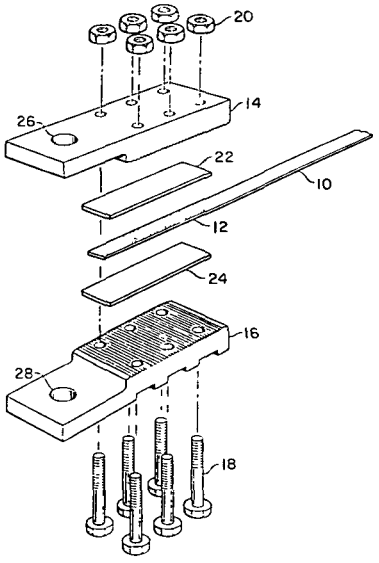


N83-12176*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
METHOD AND APPARATUS FOR GRIPPING UNIAXIAL FIBROUS COMPOSITE MATERIALS Patent Application
J. D Whittenberger and F. I. Hurwitz, inventors (to NASA) Filed 15 Sep. 1982 11 p
(NASA-Case-LEW-13758-1; US-Patent-Appl-SN-418139) Avail: NTIS HC A02/MF A01 CSCL 11D

A strip specimen is cut from a unidirectional strong, brittle fiber composite material, and the surfaces of both ends of the specimen are grit-blasted. The specimen is then placed between metal load transfer members having grit-blasted surfaces. Sufficient compressive stress is applied to the load transfer members to prevent slippage during testing at both elevated temperatures and room temperatures. The need for adhesives, load pads, and other secondary composite processing is eliminated. This gripping system was successful in tensil testing, creep-rupture testing, and fatigue testing uniaxial composite materials at 316 C. NASA



N83-13172* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
METHOD OF REPAIRING SURFACE DAMAGE TO POROUS REFRACTORY SUBSTRATES Patent
Glenn M. Ecord, inventor (to NASA) Issued 9 Nov. 1982 7 p Filed 22 May 1981 Supersedes N81-29231 (19 - 20, p 2743)
(NASA-Case-MSC-18736-1; US-Patent-4,358,480;
US-Patent-Appl-SN-266254; US-Patent-Class-427-140;
US-Patent-Class-244-158A; US-Patent-Class-427-292;
US-Patent-Class-427-379; US-Patent-Class-427-384;
US-Patent-Class-427-387; US-Patent-Class-427-302;
US-Patent-Class-428-63) Avail: US Patent and Trademark Office CSCL 11D

A damaged porous refractory material coated with a glass coating is repaired by applying hydrolyzed tetraethyl orthosilicate to the damaged area and curing it. A pliable filler comprised of hydrolyzed tetraethyl orthosilicate and powdered refractory substrate is then applied to the area which is then heated.

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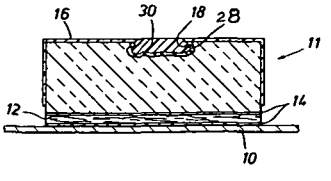
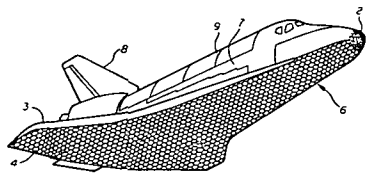


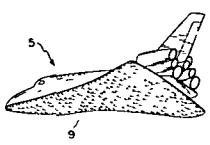
N83-17601*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
PRESTRESSED THERMAL PROTECTION SYSTEMS Patent Application
Thomas J. Dunn, inventor (to NASA) Filed 15 Sep. 1982 14 p (NASA-Case-MSC-20254-1; US-Patent-Appl-SN-418137) Avail: NTIS HC A02/MF A01 CSCL 11D

An attachment system is disclosed for a thermal protection system formed of overlapping hexagonal advanced carbon carbon (ACC) panels. A framework of adhesively attached spacer bars forms hexagonal pockets. In the center of each pocket there is a mechanically attached stanchion. Low density batt insulation is located in each pocket. Each protective panel has a central hub and a threaded fastener extends through the hub and into threads in the stanchion to draw the panel into contact with the stanchion. An ACC disc covers the top of the fastener to protect it. The installed panels are prestressed in bending, the fasteners in tension, and the spacer bars in compression so that the edges of the panels remain in firm contact with the overlapped lips of adjacent panels. The thickness, size and precurvature of the panels are sized so that the forces generated on lift off will not overcome the preload. The hexagonal planform of the panels provide a large ratio of area to circumference and provides a smooth array without long extending straight lines. NASA



N83-17602*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
SHELL TILE THERMAL PROTECTION SYSTEM Patent Application
Ian O. MacConochie, Ashby G. Lawson, and H. Neale Kelly, inventors (to NASA) Filed 20 Oct. 1982 21 p
(NASA-Case-LAR-12862-1; US-Patent-Appl-SN-435511) Avail: NTIS HC A02/MF A01 CSCL 11D

A reusable, externally applied thermal protection system for use on aerospace vehicles subject to high thermal and mechanical stresses utilizes a shell tile structure which effectively separates its primary functions as an insulator and load absorber. The tile consists of structurally strong upper and lower metallic shells manufactured from materials meeting the thermal and structural requirements incident to tile placement on the spacecraft. A lightweight, high temperature package of insulation is utilized in the upper shell while a lightweight, low temperature insulation is utilized in the lower shell. Assembly of the tile which is facilitated by a self-looking mechanism, may occur subsequent to installation of the lower shell on the spacecraft structural skin. NASA



25 INORGANIC AND PHYSICAL CHEMISTRY

Includes chemical analysis, e.g., chromatography; combustion theory; electrochemistry; and photochemistry.

For related information see also *77 Thermodynamics and Statistical Physics.*

N83-10126* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
ELECTROPHORESIS DEVICE Patent
Percy H. Rhodes and Robert S. Snyder, inventors (to NASA) Issued 16 Apr. 1981 9 p Filed 16 Apr. 1981 Supersedes N81-29179 (19 - 20, p 2735)
(NASA-Case-MFS-25426-1; US-Patent-4,349,429; US-Patent-Appl-SN-254575; US-Patent-Class-204-299R) Avail: US Patent and Trademark Office CSCL 07D

A device for separating cellular particles of a sample substance into fractionated streams of different cellular species includes a casing having a distribution chamber, a separation chamber, and a collection chamber. The electrode chambers are separated from the separation chamber interior by means of passages such that flow variations and membrane variations around the slotted portion of the electrode chamber do not enduce flow perturbations into the laminar buffer curtain flowing in the separation chamber The cellular particles of the sample are separated under the influence of the electrical field and the separation chamber into streams of different cellular species The streams of separated cells enter a partition array in the collection chamber where they are fractionated and collected.

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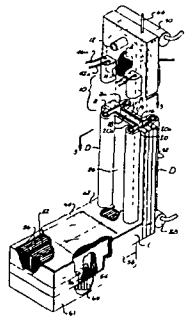

N83-13187* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
STATIC CONTINUOUS ELECTROPHORESIS DEVICE Patent
Percy H. Rhodes, inventor (to NASA) Issued 9 Nov. 1982 8 p Filed 6 Oct. 1981 Supersedes N82-11147 (20 - 02, p 0162)
(NASA-Case-MFS-25306-1; US-Patent-4,358,358; US-Patent-Appl-SN-309293; US-Patent-Class-204-299R; US-Patent-Class-204-280R) Avail: US Patent and Trademark Office CSCL 07D

An apparatus is disclosed for carrying out a moving wall type electrophoresis process for separation of cellular particles. The apparatus includes a water-tight housing containing an electrolytic buffer solution. A separation chamber in the housing is defined by spaced opposed moving walls and spaced opposed side walls. Substrate assemblies, which support the moving wall include vacuum ports for positively sealing the moving walls against the substrate walls. Several suction conduits communicate with the suction ports and are arranged in the form of valleys in a grid plate. The raised land portion of the grid plat supports the substrate walls against deformation inwardly under suction. A cooling chamber is carried on the back side of plate. The apparatus also

has tensioner means including roller and adjustment screws for maintaining the belts in position and a drive arrangement including an electric motor with a gear affixed to its output shaft. Electrode assemblies are disposed to provide the required electric field.

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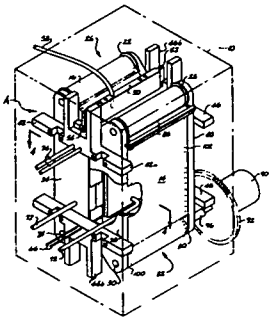
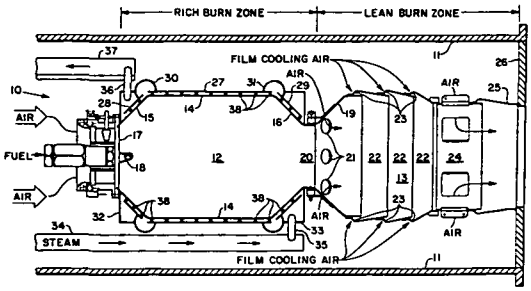


N83-17628*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

STEAM COOLED RICH-BURN COMBUSTOR LINER Patent Application

Donald F. Schultz, inventor (to NASA) Filed 23 Dec. 1982 10 p (NASA-Case-LEW-13609-1; US-Patent-Appl-SN-452465) Avail: NTIS HC A02/MF A01 CSCL 21B

Stress on the wall of the primary combustor is minimized. Thus, the steam pressure in the inlet manifold is approximately the same as the combustor discharge pressure at the throat, and annular expansion tubes minimize stresses in the jacket. The second combustor accomplishes lean burning of the gases discharged from primary combustor. The combination of the rich burning of heavy fuels followed by lean burning minimizes the NOx in the exhaust gas discharged from combustor. The novelty of the invention appears to lie in cooling a rich burn combustor with spiral streams of saturated steam flowing between the combustor linear and the jacket at a predetermined pressure; the jacket including stress relief means. NASA

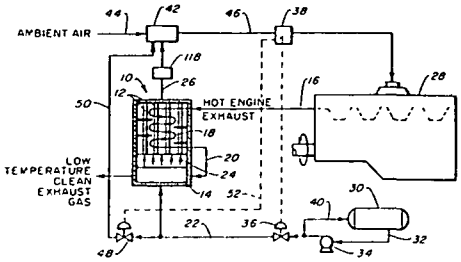


N83-19826*# National Aeronautics and Space Administration. Pasadena Office, Calif.

COMBUSTION ENGINE SYSTEM Patent Application

John Houseman (JPL, California Inst. of Tech., Pasadena) and Gerald E. Voecks, inventors (to NASA) (JPL, California Inst. of Tech., Pasadena) Filed 16 Aug. 1982 35 p (NASA-Case-NPO-14565-2; US-Patent-Appl-SN-408266) Avail: NTIS HC A03/MF A01 CSCL 07D

A flow through catalytic reactor which selectively catalytically decomposes methanol into a soot free hydrogen rich product gas utilizing engine exhaust at temperatures of 200 to 650 C to provide the heat for vaporizing and decomposing the methanol is described. The reactor is combined with either a spark ignited or compression ignited internal combustion engine or a gas turbine to provide a combustion engine system. The system may be fueled entirely by the hydrogen rich gas produced in the methanol decomposition reactor or the system may be operated on mixed fuels for transient power gain and for cold start of the engine system. The reactor includes a decomposition zone formed by a plurality of elongated cylinders which contain a body of vapor permeable, methanol decomposition catalyst preferably a shift catalyst such as copper-zinc. NASA



26 METALLIC MATERIALS

Includes physical, chemical, and mechanical properties of metals, e.g., corrosion; and metallurgy.

N83-10170* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

MECHANICAL BONDING OF METAL METHOD

Bruce A. Banks, inventor (to NASA) 26 Nov. 1980 11 p Filed 26 Nov. 1980 Supersedes N81-16329 (19 - 07, p 0899) (NASA-Case-LEW-12941-1; US-Patent-4,349,954; US-Patent-Appl-SN-210632; US-Patent-Class-29-458; US-Patent-Class-29-521; US-Patent-Class-403-282) Avail: US Patent and Trademark Office CSCL 11F

A method is disclosed for joining the surfaces of two metal structures in a mechanical bond. The joining process can be performed in either air or vacuum. The metal surfaces of the structures that are to be bonded are exposed to an ion beam together with a target of low sputtering yield material. This material deposits on the surfaces and creates sites of sputter resistance which evolve into peaks of a cone like surface microstructure. The textured metal surfaces are arranged in face to face relationship and compressed together with plastic deformation which mechanically interlocks the cone. A large interface area is produced which minimizes thermal and electrical losses. Also, no electrical power or heat is required during metal joining.

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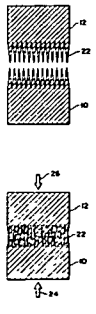
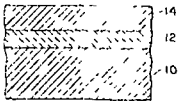


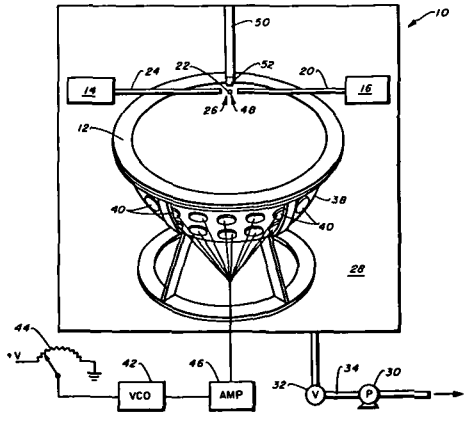
N83-17683*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
COATING WITH OVERLAY METALLIC-CERMET ALLOY SYSTEMS Patent Application
Michael A. Gedwill, Stanley R. Levine, and Thomas K. Glasgow, inventors (to NASA) Filed 7 Jan. 1983 12 p
(NASA-Case-LEW-13639-2; US-Patent-Appl-SN-456460) Avail: NTIS HC A02/MF A01 CSCL 11F

A base layer of an oxide dispersed, metallic alloy (cermet) is arc plasma sprayed onto a substrate, such as a turbine blade, vane, or the like, which is subjected to high temperature use. A top layer of an oxidation, hot corrosion, erosion resistant alloy of nickel, cobalt, or iron is then arc plasma sprayed onto the base layer. A heat treatment is used to improve the bonding. The base layer serves as an inhibitor to interdiffusion between the protective top layer and the substrate. Otherwise, the 10 protective top layer would rapidly interact detrimentally with the substrate and degrade by spalling of the protective oxides formed on the outer surface at elevated temperatures. NASA



N83-19890*# National Aeronautics and Space Administration. Pasadena Office, Calif.
PRODUCTION OF ULTRAPURE AMORPHOUS METALS UTILIZING ACOUSTIC COOLING Patent Application
Mark C. Lee, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) Filed 21 Dec 1982 17 p
(Contract NAS7-100)
(NASA-Case-NPO-15658-1, US-Patent-Appl-SN-451896) Avail: NTIS HC A02/MF A01 CSCL 11F

Amorphous metals are produced by forming a molten unit of metal and deploying the unit into a bidirectional acoustical levitating field or by dropping the unit through a spheroidizing zone, a slow quenching zone, and a fast quenching zone in which the sphere is rapidly cooled by a bidirectional jet stream created in the standing acoustic wave field produced between half cylindrical a acoustic driver and a focal reflector or a curved driver and a reflector. The cooling rate can be further augmented by first a cryogenic liquid collar and second a cryogenic liquid jacket surrounding the drop tower. The sphere is quenched to an amorphous solid which can survive impact in the unit collector or is retrieved by a vacuum chuck. NASA

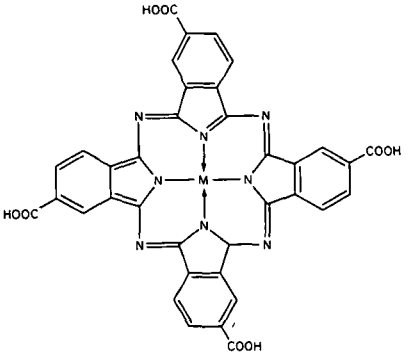


27 NONMETALLIC MATERIALS

Includes physical, chemical, and mechanical properties of plastics, elastomers, lubricants, polymers, textiles, adhesives, and ceramic materials

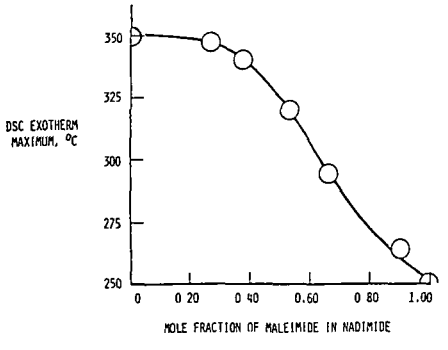
N83-12239*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
METAL PHTHALOCYANINE POLYMERS Patent Application
Bappaige N. Achar (NAS-NRC, Washington, D.C.), George M. Fohlen, and John A. Parker, inventors (to NASA) Filed 8 Sep. 1982 21 p
(NASA-Case-ARC-11405-1; US-Patent-Appl-SN-415880) Avail: NTIS HC A02/MF A01 CSCL 11I

Metal 4, 4', 4', 4"-tetracarboxylic phthalocyanines (MPTC) are prepared by reaction of trimellitic anhydride, a salt or hydroxide of the desired metal (or the metal in powdered form), urea and a catalyst. A purer form of MPTC is prepared than heretofore. These tegracarboxylic acids are then polymerized by heat to sheet polymers which have superior heat and oxidation resistance. The metal is preferably a divalent metal having an atomic radius close to 1.35A. NASA



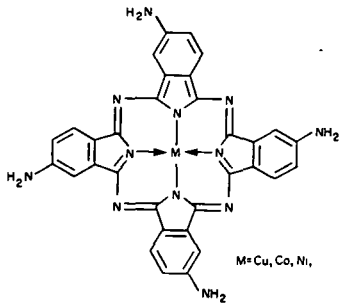
N83-13258*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
CHEMICAL APPROACH FOR CONTROLLING NADAMIDE CURE TEMPERATURE AND RATE Patent Application
Richard W Lauver, inventor (to NASA) Filed 3 Aug. 1982 22 p
(NASA-Case-LEW-13770-1; US-Patent-Appl-SN-404809) Avail: NTIS HC A02/MF A01 CSCL 11I

Polyimide resins suitable for use as composite matrix materials are formed by copolymerization of maleic and norbornenyl endcapped monomers and oligomers. The copolymers can be cured at temperatures under about 300 C by controlling the available concentration of the maleic-capped reactant. This control can be achieved by adding sufficient amounts of said maleic reactant, or by chemical modification of either copolymer, so as to either increase Diels-Alder retrogression of the norbornenyl capped reactant and/or holding initiation and polymerization to a rate compatible with the availability of the maleic-capped reactant. Author



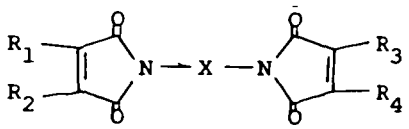
N83-14275*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
PHTHALOCYANINE POLYMERS Patent Application
Bappalige N. Achar (NAS-NRC, Washington, D.C.), George M. Fohlen, and John A. Parker, inventors (to NASA) Filed 10 Nov. 1982 31 p
(NASA-Case-ARC-11413-1; US-Patent-Appl-SN-440656) Avail: NTIS HC A03/MF A01 CSCL 11G

The invention relates to polymers of metal 4',4',4'',4'''-tetraamino phthalocyanines, wherein the metal is preferably from divalent metals such as divalent copper, cobalt or nickel, with tetracarboxylic dianhydrides and copolymers of such phthalocyanines with such dianhydrides and diamines. The dianhydrides and diamines are preferably aromatic. The direct product of polymerization is a polyamic acid having free carboxyl groups. This amic acid is heated to dehydrocyclize the polyamic acid and form the polyimide. The invention also relates to a method of preparing the tetraamino phthalocyanine by reduction of the corresponding tetranitro phthalocyanine. Thermally and oxidatively stable sheet polymers result which are useful for various purposes such as heat shielding or heat resistant films. NASA



N83-14276*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
ELASTOMER-MODIFIED PHOSPHORUS-CONTAINING IMIDE RESINS Patent Application
George M. Fohlen, Indra K. Varma (NAS-NRC), and John A. Parker, inventors (to NASA) Filed 15 Nov. 1982 19 p
(NASA-Case-ARC-11400-1; US-Patent-Appl-SN-441899) Avail: NTIS HC A02/MF A01 CSCL 11G

Phosphorus containing polymide resins modified with low molecular weight di(amino-group terminated) elastomers are thermally curable and are useful in producing heat, fire, solvent and chemical resistant materials such as fiber reinforced composites and laminates. NASA



N83-15465* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio
POLYVINYL ALCOHOL CROSS-LINKED WITH 2 ALDEHYDES Patent
Dean W Sheibley, Lorra L. Rieker, Li-Chen Hsu, and Michelle A. Manzo, inventors (to NASA) Issued 10 Jun. 1981 6 p Filed 10 Jun. 1981 Supersedes N81-27279 (19 - 18, p 2459)
(NASA-Case-LEW-13524-1; US-Patent-4,357,402; US-Patent-Appl-SN-272234; US-Patent-Class-429-206; US-Patent-Class-264-104; US-Patent-Class-429-253; US-Patent-Class-525-61) Avail: US Patent and Trademark Office CSCL 07C

A film-forming polyvinyl alcohol resin is admixed, in aqueous solution, with a dialdehyde crosslinking agent which is capable of crosslinking the polyvinyl alcohol resin and a water soluble acid aldehyde containing a reactive aldehyde group capable of reacting with hydroxyl groups in the polyvinyl alcohol resin and an ionizable acid hydrogen atom The dialdehyde is present in an amount sufficient to react with from 1% to 20% by weight of the theoretical amount required to react with all of the hydroxyl groups of the polyvinyl alcohol. The amount of acid aldehyde is from 1% to 50% by weight, same basis, and is sufficient to reduce the pH of the aqueous admixture to 5 or less. The admixture is then formed into a desired physical shape, such as by casting a sheet or film, and the shaped material is then heated to simultaneously dry and crosslinking the article

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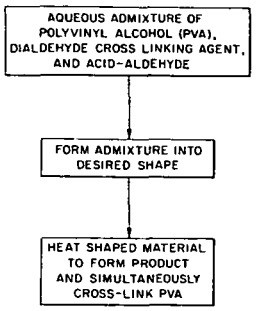
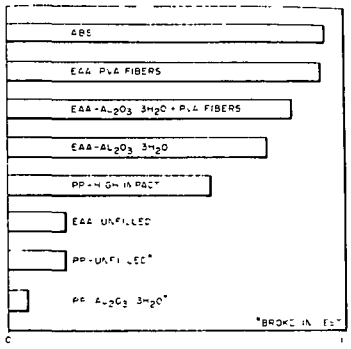


N83-17714*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
METHOD OF FABRICATING AN ABRADABLE GAS PATH SEAL Patent Application
D. W. Wisander and R. C. Bill, inventors (to NASA) Filed 30 Sep. 1982 9 p
(NASA-Case-LEW-13269-2; US-Patent-Appl-SN-431448) Avail: NTIS HC A02/MF A01 CSCL 11B

This invention is directed to improving the thermal shock resistance of a ceramic layer. The invention is particularly directed to an improved abradable lining that is deposited on a shroud forming a gas-path seal in turbomachinery. Improved thermal shock resistance of a shroud is effected through the deliberate introduction of 'benign' cracks. These are microcracks which will not propagate appreciably upon exposure to the thermal shock environment in which a turbine seal must function. Laser surface fusion treatment is used to introduce these microcracks. The ceramic surface is laser scanned to form a continuous dense layer. As this layer cools and solidifies, shrinkage results in the formation of a very fine crack network. The presence of this deliberately introduced fine crack network precludes the formation of a catastrophic crack during thermal shock exposure. NASA

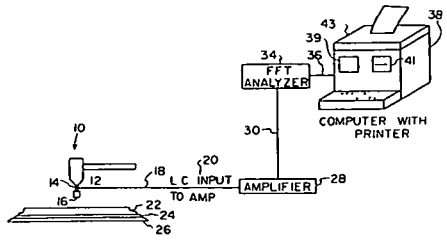
N83-19900* National Aeronautics and Space Administration. Pasadena Office, Calif.
ELASTOMER COATED FILLER AND COMPOSITES THEREOF COMPRISING AT LEAST 60% BY WEIGHT OF A HYDRATED FILLER AND AN ELASTOMER CONTAINING AN ACID SUBSTITUENT Patent
William A. Mueller (JPL, California Inst of Tech., Pasadena), John D. Ingham (JPL, California Inst of Tech., Pasadena), and William W. Reilly, inventors (to NASA) (JPL, California Inst. of Tech., Pasadena) Issued 8 Feb 1983 7 p Filed 11 Jan. 1980 Sponsored by NASA
(NASA-Case-NPO-14857-1; US-Patent-4,373,039; US-Patent-Appl-SN-158530; US-Patent-Class-523-205, US-Patent-Class-524-436; US-Patent-Class-524-437; US-Patent-Class-524-503; US-Patent-Class-524-564; US-Patent-Class-524-786) Avail: US Patent and Trademark Office CSCL 11C

The impact resistance of flame retardant composites, especially thermoplastic molding: compounds containing over 60% hydrated mineral filler such as Al(OH)3 or Mg(OH)2 as improved by coating the filler with 1 to 20% of an elastomer. The composite will fail by crazing or shearing rather than by brittle fracture. A well bonded elastomeric interphase resulted by utilizing acidic substituted resins such as ethyl-hexyl acrylate-acrylic acid copolymers which bond to and are cross-linked by the basic filler particles. Further improvement in impact resistance was provided by incorporating 1 to 10% of a resin fiber reinforcement such as polyvinyl alcohol fibers that decompose to yield at least 30% water when heated to decomposition temperature. Author



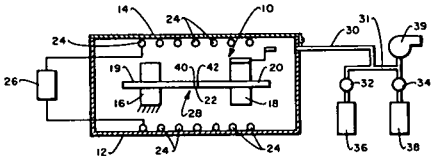
N83-19903# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
INSULATION BONDING TEST SYSTEM Patent Application
Garland D. Johnston, Archie D. Coleman, Joseph N. Portwood, Jerry M. Saunders, John W. Redmon, and Allen C. Porter (Teledyne Brown Engineering Co., Huntsville, Ala.) Filed 10 Feb. 1983 19 p
(NASA-Case-MFS-25862-1; US-Patent-Appl-SN-465366) Avail: NTIS HC A02/MF A01 CSCL 11A

A method and a system for the bonding of foam insulation attached to metal is described The system involves the use of an impacter which has a calibrated load cell mounted on a plunger and a hammer head mounted on the end of the plunger. When the impacter strikes the insulation at a point to be tested, the load cell measures the force of the impact and the precise time interval during which the hammer head is in contact with the insulation. This information is transmitted as an electrical signal to a load cell amplifier where the signal is conditioned and then transmitted to a Fast Fourier Transform (FFT) analyzer. The FFT analyzer produces energy spectral density curves (power plotted against frequency in Hertz) which are displayed on a video screen. NASA



N83-19904*# National Aeronautics and Space Administration. Pasadena Office, Calif
ABSORBABLE SUSCEPTOR JOINING OF CERAMIC SURFACES Patent Application
James E. Schroeder (JPL, California Inst. of Tech, Pasadena) and Paul J. Shlichta, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) Filed 10 Feb. 1983 19 p
(Contract NAS7-100)
(NASA-Case-NPO-15640-1, US-Patent-Appl-SN-465367) Avail: NTIS HC A02/MF A01 CSCL 11B

An assembly of ceramic surfaces, particularly refractory metal oxides and carbides, abutting a thin sheet of metal susceptor material are placed in a chamber of an enclosure containing inert gas. An r.f. coil is activated by power supply to melt the susceptor and adjacent zones of the ceramic. Reactive gas such as oxygen or a carbonizing gas is then fed to the chamber and reacts with the susceptor to form compounds which disperse and dissolve in the zones. On cooling, a strong joint is formed. The susceptor may contain inner perforations and outer perforations to aid in distribution of heat NASA



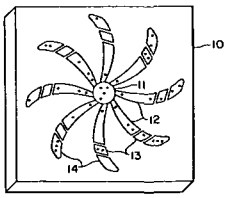
31 ENGINEERING (GENERAL)

Includes vacuum technology; control engineering; display engineering, and cryogenics

N83-17745*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
MULTICOLOR PRINTING PLATE JOINING Patent Application
William J. Waters, inventor (to NASA) Filed 28 Sep. 1982 12 p
(NASA-Case-LEW-13598-1; US-Patent-Appl-SN-425203) Avail: NTIS HC A02/MF A01 CSCL 13H

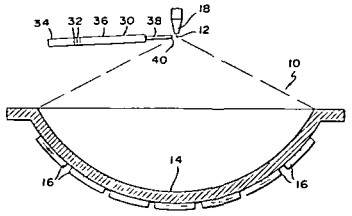
An upper plate having ink flow channels and a lower plate having a multicolored 5 pattern are joined without clogging any ink flow paths. A pattern having different colored parts and apertures is formed in a lower plate. Ink flow channels each having respective ink input ports are formed in an upper plate. The ink flow channels are coated with solder mask and the bottom of the upper plate is then coated with solder. The upper and lower plates are pressed together at from 2 to 5 psi and heated to a temperature

of from 295 F to 750 F or enough to melt the solder. After the plates have cooled and the pressure is released, the solder mask is removed from the interior passageways by means of a liquid solvent. NASA



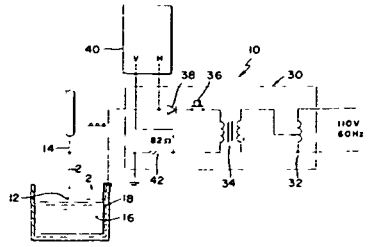
N83-17746*# National Aeronautics and Space Administration. Pasadena Office, Calif.
CONTACTLESS PELLET FABRICATION Patent Application
Mark C. Lee, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) Filed 26 Oct. 1981 12 p Sponsored by NASA (NASA-Case-NPO-15592-1; US-Patent-Appl-SN-314702) Avail: NTIS HC A02/MF A01 CSCL 13H

A small object is coated by holding it in the pressure well of an acoustic standing wave pattern, and then applying a mist of liquid coating material at low velocity into the pressure well. The pressure gradient within the well forces the mist particles to be pushed against the object. A lower frequency acoustic wave also can be applied to the coated object, to vibrate it so as to evenly distribute the coated material. The same lower frequency vibrations can be applied to an object in the shape of a hollow sphere, to center the inner and outer surfaces of the sphere while it remains suspended. NASA



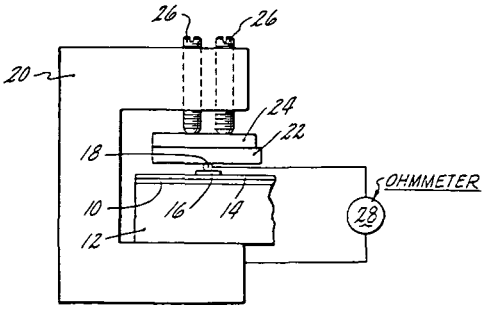
N83-19947* National Aeronautics and Space Administration. Pasadena Office, Calif.
THIN WIRE POINTING METHOD Patent
Gordon Green (JPL, California Inst. of Tech , Pasadena) and Robert J. Mattauch, inventors (to NASA) (JPL, California Inst of Tech., Pasadena) Issued 1 Mar. 1983 4 p Filed 17 Nov. 1981 Supersedes N82-24426 (20 - 15, p 2078) Sponsored by NASA (NASA-Case-NPO-15789-1; US-Patent-4,375,396; US-Patent-Appl-SN-322316; US-Patent-Class-204-129.55; US-Patent-Class-204-129.75) Avail: US Patent and Trademark Office CSCL 13I

A method is described for forming sharp tips on thin wires, in particular phosphor bronze wires of diameters such as one-thousandth inch used to contact micron size Schottky barrier diodes, which enables close control of tip shape and which avoids the use of highly toxic solutions. The method includes dipping an end of a phosphor bronze wire into a dilute solution of sulfamic acid and applying a current through the wire to electrochemically etch it. The humidity in the room is controlled to a level of less than 50%, and the voltage applied between the wire and another electrode in the solutions is a half wave rectified voltage. The current through the wire is monitored, and the process is stopped when the current falls to a predetermined low level.
Official Gazette of the U.S. Patent and Trademark Office



N83-19949*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
JOINING LEAD WIRES TO THIN PLATINUM ALLOY FILMS Patent Application
John S. Przybyszewski (Pratt and Whitney Aircraft Group, East Hartford, Conn.) and Richard G Claing, inventors (to NASA) (Pratt and Whitney Aircraft Group, East Hartford, Conn.) Filed 4 Dec. 1980 14 p
(Contract NAS3-20768)
(NASA-Case-LEW-13934-1; US-Patent-Appl-SN-212949) Avail: NTIS HC A02/MF A01 CSCL 13H

Disclosed is a two-step process of joining a lead wire to a 2 x 1/10 to the 6th power m thick platinum alloy film which rests upon an equally thin alumina insulating layer which is adhered to a metal substrate. Typically the platinum alloy film forms part of a thermocouple for measuring the surface temperature of a gas turbine airfoil. In the first step the lead wire is deformed 30 to 60% at room temperature while the characteristic 10 to the 6th power ohm resistance of the alumina insulating layer is monitored for degradation. In the second step the cold pressed assembly is heated at 865 to 1025 C for 4 to 75 hr in air. During the heating step any degradation of insulating layer resistance may be reversed, provided the resistance was not decreased below 100 ohm in the cold pressing. NASA



32 COMMUNICATIONS

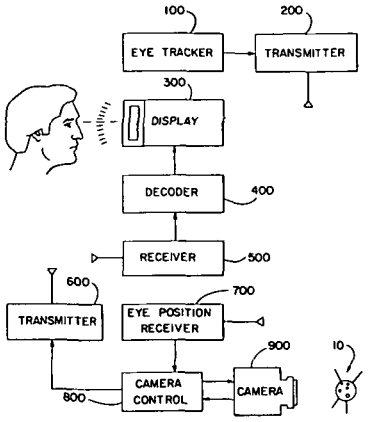
Includes land and global communications; communications theory; and optical communications.

For related information see also *04 Aircraft Communications and Navigation* and *17 Spacecraft Communications, Command and Tracking.*

N83-12308*# National Aeronautics and Space Administration. Pasadena Office, Calif.
RETINALLY STABILIZED DIFFERENTIAL RESOLUTION TELEVISION DISPLAY Patent Application

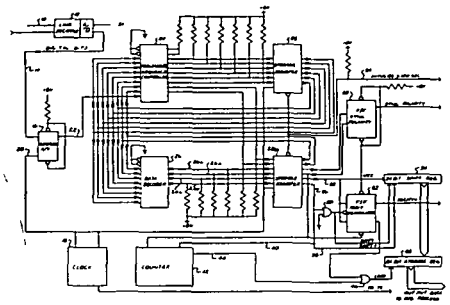
Carl F. Ruoff (JPL, California Inst. of Tech, Pasadena) Filed 28 Sep. 1982 23 p
(Contract NAS7-100)
(NASA-Case-JPO-15432-1; US-Patent-Appl-SN-425204) Avail: NTIS HC A02/MF A01 CSCL 17B

A remote television viewing system employing an eye tracker is presented, wherein a small region of the image appears in high resolution, and the remainder of the image appears in low resolution. The eye tracker monitors the position of the viewer's line of sight. The eye tracker position data is transmitted to the remote television camera and control. Both the remote camera and television display are adapted to have selectable high-resolution and low-resolution raster scan modes. The position data from the eye tracker is used to determine the point at which the high-resolution scan is to commence. The video data defining the observed image is encoded in a novel format, wherein in each data field, the data representing the position of the high-resolution region of predetermined size appears first, followed by the high-resolution zone video data and then the low-resolution region data.
NASA



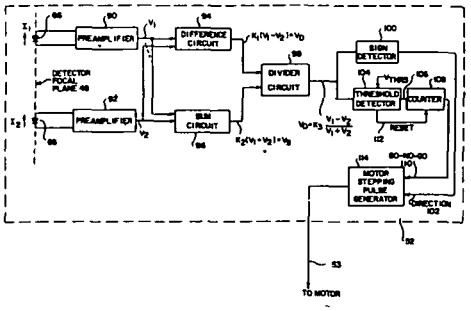
N83-13323* National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, Fla.
SERIAL DATA CORRELATOR/CODE TRANSLATOR Patent
Larry E. Morgan, inventor (to NASA) Issued 9 Nov. 1982 6 p Filed 27 Jul. 1979 Supersedes N79-28383 (17 - 19, p 2532)
(NASA-Case-KSC-11025-1; US-Patent-4,358,846;
US-Patent-Appl-SN-061327; US-Patent-Class-371-6) Avail: US Patent and Trademark Office CSCL 17B

A system for analyzing asynchronous signals containing bits of information for ensuring the validity of said signals, by sampling each bit of information a plurality of times, and feeding the sampled pieces of bits of information into a sequence controlled is described. The sequence controller has a plurality of maps or programs through which the sampled pieces of bits are stepped so as to identify the particular bit of information and determine the validity and phase of the bit. The step in which the sequence controller is clocked is controlled by a storage register. A data decoder decodes the information fed out of the storage register and feeds such information to shift registers for storage.
Official Gazette of the U.S. Patent and Trademark Office



N83-18975* National Aeronautics and Space Administration. Pasadena Office, Calif.
SERVOMECHANISM FOR DOPPLER SHIFT COMPENSATION IN OPTICAL CORRELATOR FOR SYNTHETIC APERTURE RADAR Patent
Nicholas J. Constantinides (JPL, California Inst. of Tech., Pasadena) and Thomas J. Bicknell, inventors (to NASA) (JPL, California Inst. of Tech., Pasadena) Issued 9 Oct. 1980 9 p Filed 9 Oct. 1980 Sponsored by NASA
(NASA-Case-NPO-14998-1; US-Patent-4,371,946;
US-Patent-Appl-SN-195547; US-Patent-Class-364-822;
US-Patent-Class-250-203R; US-Patent-Class-343-5CM;
US-Patent-Class-343-100CL; US-Patent-Class-364-861) Avail: US Patent and Trademark Office CSCL 17I

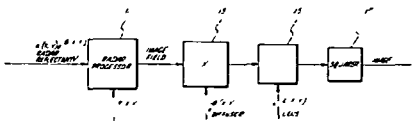
A method and apparatus for correcting Doppler shifts in synthetic aperture radar data is described. An optical correlator for synthetic aperture radar data has a means for directing a laser beam at a signal film having radar return pulse intensity information recorded on it. A resultant laser beam passes through a range telescope, an azimuth telescope, and a Fourier transform filter located between the range and azimuth telescopes, and forms an image for recording on an image film. A compensation means for Doppler shift in the radar return pulse intensity information includes a beam splitter for reflecting the modulated laser beam, after having passed through the Fourier transform filter, to a detection screen having two photodiodes mounted on it.
Official Gazette of the U.S. Patent and Trademark Office



N83-19968* *National Aeronautics and Space Administration.* Pasadena Office, Calif
CLUTTER FREE SYNTHETIC APERTURE RADAR CORRELATOR Patent

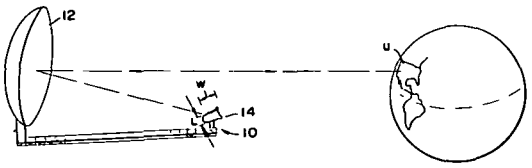
Atul Jain (JPL, California Inst. of Tech., Pasadena) Issued 8 Dec. 1977 4 p Filed 8 Dec. 1977 Supersedes N78-118266 (16 - 09, p 1142) Sponsored by NASA
(NASA-Case-NPO-14035-1; US-Patent-4,371,873;
US-Patent-Appl-SN-858767; US-Patent-Class-343-9PS;
US-Patent-Class-343-5CM; US-Patent-Class-343-100CL) Avail: US Patent and Trademark Office CSCL 17I

A synthetic aperture radar correlation system including a moving diffuser located at the image plane of a radar processor is described. The output of the moving diffuser is supplied to a lens whose impulse response is at least as wide as that of the overall processing system. A significant reduction in clutter results is given. Official Gazette of the U.S. Patent and Trademark Office



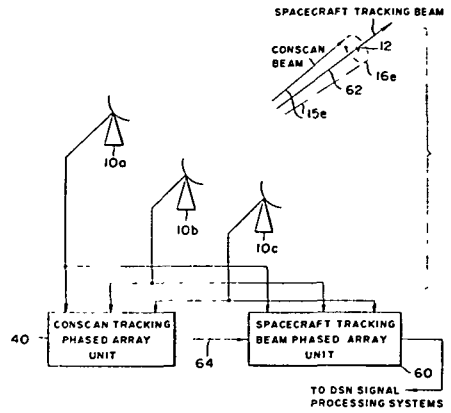
N83-19969*# National Aeronautics and Space Administration. Pasadena Office, Calif.
BEAM FORMING NETWORK Patent Application
Paul W. Cramer, Jr., inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) Filed 7 Dec. 1982 20 p
(Contract NAS7-100)
(NASA-Case-NPO-15743-1; US-Patent-Appl-SN-448441) Avail: NTIS HC A02/MF A01 CSCL 09C

A feed element to beam interconnection network is provided for an antenna that transmits and receives a large number of beams, such as contiguous narrow beams that cover the United States. The network, which is connected to a layer of feed elements that transmit and receive microwaves, consists of a pair of circuit boards parallel to the feed element layer. One of the two boards has dividers that each divide a signal to be transmitted into seven portions, and the other board has 134 combiners that each collect seven transmit signal portions and deliver the sum to one of the feed elements. A similar arrangement is used to handle received signals, with 134 receive signal dividers on the one board, and 87 receive signal combiners on the other board. NASA



N83-19970*# National Aeronautics and Space Administration. Pasadena Office, Calif.
ELECTRONIC CONSCANNING SPACECRAFT COMMUNICATION SYSTEM Patent Application
James R. Lesh, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) Filed 14 Jan. 1983 13 p
(Contract NAS7-100)
(NASA-Case-NPO-15899-1; US-Patent-Appl-SN-457991) Avail: NTIS HC A02/MF A01 CSCL 17B

An electronic conscanning spacecraft communication system includes an array of antennas which produce a first synthesized conscanning narrow beam which by means of a conscan tracking phased array unit is steerable to circle around a spacecraft. Also included is a spacecraft tracking phased array unit, which produces a spacecraft tracking beam. The scanning beam is adjusted so that the spacecraft is at the circle center and further provides signals to adjust the beam to point directly at the spacecraft. NASA



33 ELECTRONICS AND ELECTRICAL ENGINEERING

Includes test equipment and maintainability; components, e.g., tunnel diodes and transistors; microminiaturization, and integrated circuitry.

For related information see also *60 Computer Operations and Hardware* and *76 Solid-State Physics.*

N83-10345* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
COMBINATIONAL LOGIC FOR GENERATING GATE DRIVE SIGNALS FOR PHASE CONTROL RECTIFIERS Patent
Carlisle R. Dolland (AiResearch Mfg. Co., Torrance, Calif.) and Daniel W. Trimble, inventors (to NASA) (AiResearch Mfg. Co., Torrance, Calif.) Issued 21 Sep. 1982 12 p Filed 30 Jun. 1981 Supersedes N81-27402 (19 - 18, p 2477) Sponsored by NASA
(NASA-Case-MFS-25208-1; US-Patent-4,351,022;
US-Patent-Appl-SN-280154; US-Patent-Class-363-87;
US-Patent-Class-318-803) Avail: US Patent and Trademark Office CSCL 09C

Control signals for phase-delay rectifiers, which require a variable firing angle that ranges from 0 deg to 180 deg, are derived from line-to-line 3-phase signals and both positive and negative firing angle control signals which are generated by comparing current command and actual current. Line-to-line phases are transformed into line-to-neutral phases and integrated to produce 90 deg phase delayed signals that are inverted to produce three cosine signals, such that for each its maximum occurs at the intersection of positive half cycles of the other two phases which are inputs to other inverters. At the same time, both positive and negative (inverted) phase sync signals are generated for each phase by comparing each with the next and producing a square wave when it is greater. Ramp, sync and firing angle controls

signals are than used in combinational logic to generate the gate firing control signals SCR gate drives which fire SCR devices in a bridge circuit.

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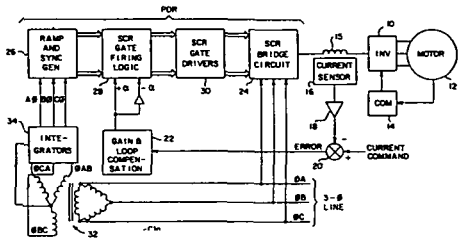


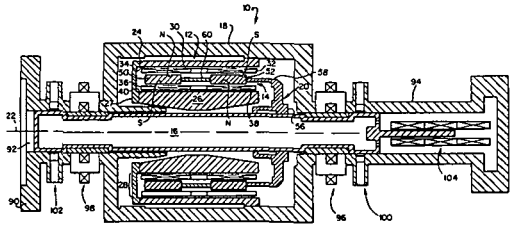
N83-12332*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md

RECIPROCATING LINEAR MOTOR Patent Application

Michael P. Goldowsky, inventor (to NASA) (North American Philips Corp., Tarrytown, N.Y.) Filed 29 Oct. 1982 18 p Sponsored by NASA

(NASA-Case-GSC-12773-1; US-Patent-Appl-SN-437914) Avail: NTIS HC A02/MF A01 CSCL 09A

A reciprocating linear motor is formed with a pair of ring-shaped permanent magnets having opposite radial polarizations, held axially apart by a nonmagnetic yoke, which serves as an axially displaceable armature assembly. A pair of annularly wound coils having axial lengths which differ from the axial lengths of the permanent magnets are serially coupled together in mutual opposition and positioned with an outer cylindrical core in axial symmetry about the armature assembly. One embodiment includes a second pair of annularly wound coils serially coupled together in mutual opposition and an inner cylindrical core positioned in axial symmetry inside the armature radially opposite to the first pair of coils. Application of a potential difference across a serial connection of the two pairs of coils creates a current flow perpendicular to the magnetic field created by the armature magnets, thereby causing limited linear displacement of the magnets relative to the coils. NASA



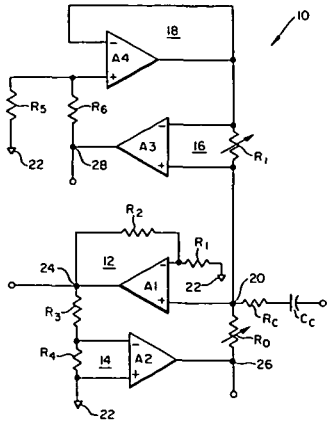
N83-12333*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

REACTANCELESS BANDPASS AMPLIFIER Patent Application

Leonard L. Kleinberg, inventor (to NASA) Filed 13 Oct. 1982 15 p

(NASA-Case-GSC-12788-1; US-Patent-Appl-SN-434085) Avail: NTIS HC A02/MF CSCL 09A

An active R bandpass filter network is formed by four operational amplifier stages interconnected by discrete resistances One pair of stages synthesizes an equivalent input impedance of an inductance in parallel with a discrete resistance while the second pair of stages synthesizes an equivalent input impedance of a capacitance serially coupled to another discrete resistance coupled in parallel with the first two stages The equivalent input impedances aggregately define a tuned resonant bandpass filter in the roll-off regions of the operational amplifiers NASA



N83-12334*# National Aeronautics and Space Administration. Pasadena Office, Calif.

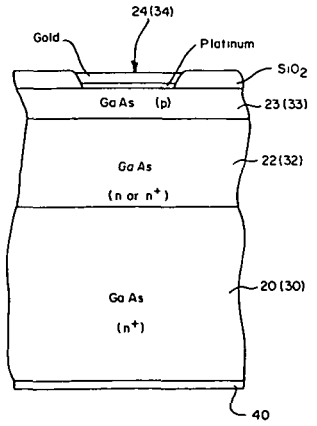
SUBMILLIMETER WAVE SCHOTTKY BARRIER DIODE WITH LOW SERIES RESISTANCE AND LOW NOISE Patent Application

Richard J. Mattauch (JPL, California Inst. of Tech., Pasadena) Filed 29 Oct. 1982 19 p

(Contract NAS7-100)

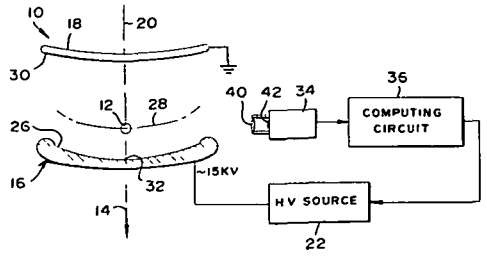
(NASA-Case-NPO-15935-1; US-Patent-Appl-SN-437913) Avail: NTIS HC A02/MF A01 CSCL 09A

A Schottky barrier diode is described in which the series resistance and noise temperature characteristics of the device are decoupled by a thin epitaxial layer between a thick epitaxial layer and a metal anode. The thin epitaxial layer is suitably doped to provide an active barrier to quantum mechanical tunneling of electrons from a degenerately doped semiconductor substrate to the metal anode. The doping concentration of the thick epitaxial layer may be for the desired reverse breakdown characteristic, such as a high concentration level for low internal resistance and low reverse breakdown characteristic, and a low concentration level for high internal resistance and high reverse breakdown characteristic. In either case, the barrier layer prevents quantum mechanical tunneling, which is the cause of high device noise. NASA



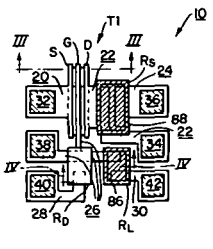
N83-12335*# National Aeronautics and Space Administration. Pasadena Office, Calif.
CLOSED LOOP ELECTROSTATIC SYSTEM Patent Application
Won Kyu Rhim, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena), Melvin M Saffren, and Daniel D. Elleman Filed 29 Oct. 1982 16 p
(Contract NAS7-100)
(NASA-Case-NPO-15553-1; US-Patent-Appl-SN-437912) Avail: NTIS HC A02/MF A01 CSCL 09C

An electrostatic levitation system is described, which can closely control the position of objects of appreciable size. A plurality of electrodes surround the desired position of an electrostatically charged object, the position of the object is monitored, and the voltages applied to the electrodes are varied to hold the object at a desired position. In one system, the object is suspended above a plate-like electrode which has a concave upper face to urge the object toward the vertical axis of the curved plate. An upper electrode that is also curved can be positioned above the object, to assure curvature of the field at any height above the lower plate. In another system, four spherical electrodes are positioned at the points of a tetrahedron, and the voltages applied to the electrodes are varied in accordance with the object position as detected by two sensors NASA



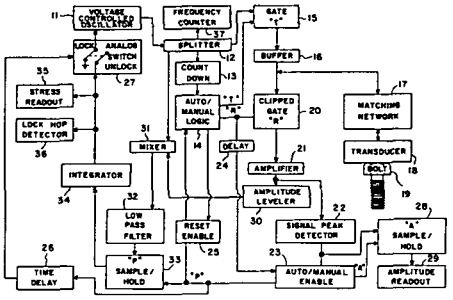
N83-13360*# National Aeronautics and Space Administration Goddard Space Flight Center, Greenbelt, Md.
INTEGRATED PHOTO-RESPONSIVE METAL OXIDE SEMICONDUCTOR CIRCUIT Patent Application
Murzban D. Jhabvala, David Dargo, and John C. Lyons, inventors (to NASA) Filed 16 Jul. 1982 15 p
(NASA-Case-GSC-12782-1; US-Patent-Appl-SN-399074) Avail: NTIS HC A02/MF A01 CSCL 09A

An infrared photoresponsive element (RD) is monolithically integrated into a source follower circuit of a metal oxide semiconductor device by depositing a layer of a lead chalcogenide as a photoresistive element forming an ohmic bridge between two metallization strips serving as electrodes of the circuit. Voltage from the circuit varies in response to illumination of the layer by infrared radiation. NASA



N83-16626* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
PULSED PHASE LOCKED LOOP STRAIN MONITOR Patent
Joseph S. Heyman, inventor (to NASA) Issued 23 Oct. 1980 7 p Filed 23 Oct. 1980 Supersedes N81-15195 (19 - 06, p 0740)
(NASA-Case-LAR-12772-1; US-Patent-4,363,242; US-Patent-Appl-SN-199767; US-Patent-Class-73-761; US-Patent-Class-73-579; US-Patent-Class-73-597; US-Patent-Class-73-629) Avail: US Patent and Trademark Office CSCL 09A

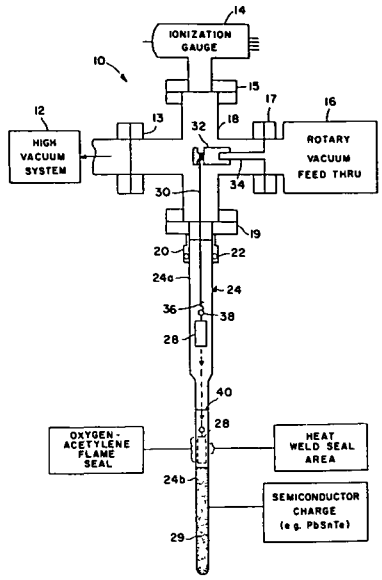
The RF output of a voltage controlled oscillator (VCO) is periodically gated to a transducer which produces acoustic waves in a bolt. The reflected acoustic waves are converted to electrical signals by the transducer and gated to a mixer which also receives the output from the VCO and produces an output which is filtered by a low pass filter. The output of filter is a dc signal proportional to the phase difference change from a fixed phase difference between the two input signals to the mixer. This dc signal is sampled at an instant and held by circuit in response to the 'P' signal. The output of the circuit is integrated and then applied to the VCO to change the frequency of the VCO such that the phase difference between the two inputs to the mixer remains at the fixed phase difference. The frequency of the VCO is a measure of the change in strain of the bolt.
Official Gazette of the U.S. Patent and Trademark Office



N83-16633*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
AMPOULE SEALING APPARATUS AND PROCESS Patent Application
William J. Debnam, Jr. and Ivan O. Clark, inventors (to NASA) Filed 30 Jun. 1982 10 p
(NASA-Case-LAR-12847-1; US-Patent-Appl-SN-393456) Avail: NTIS HC A02/MF A01 CSCL 09C

An apparatus and process for sealing fused quartz ampoules housing a semiconductor growth charge under vacuum is described. An elongated fused quartz ampoule having an enlarged diameter open end and a reduced diameter closed end is vertically retained in a vacuum assembly. A semiconductor charge is disposed within the reduced diameter portion of the ampoule. A quartz plug of substantially the same diameter as the reduced diameter portion is suspended within the open and of the ampoule via a rotary vacuum feed. After evacuation of the ampoule a plug is lowered

into the reduced diameter area and sealed therein while maintaining the vacuum on the ampoule. The charged ampoule area is then separated from the remaining structure by breaking along the scored line. NASA

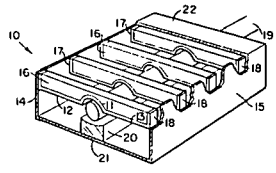


N83-17802*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

DIELECTRIC BASED SUBMILLIMETER BACKWARD WAVE OSCILLATOR CIRCUIT Patent Application

Henry G. Kosmahl, inventor (to NASA) Filed 13 Oct. 1982 9 p (NASA-Case-LEW-13736-1; US-Patent-Appl-SN-434084) Avail: NTIS HC A02/MF A01 CSCL 09C

A ladder circuit especially useful in backward wave oscillators operating in the 500 GHz to 2000 GHz range has a waveguide with transversely orientated slabs which contact an upper wall of the waveguide. The edges of the slabs adjacent to the physical center of waveguide curved segments and stubs of electrically conductive, nonmagnetic material. The ends of slabs include metal layers at opposite ends to provide a conductive leakage path. A ridge bar is attached to the inside of the bottom wall of the waveguide and includes a concave upper surface which partially straddles the electron beam The novelty of the invention lies in the ladder structure compared of thin, vapor deposited rungs supported on the edge of diamond slabs; each rung having a curved segment which straddles the electron beam together with a ridge bar which also straddles the electron beam. NASA

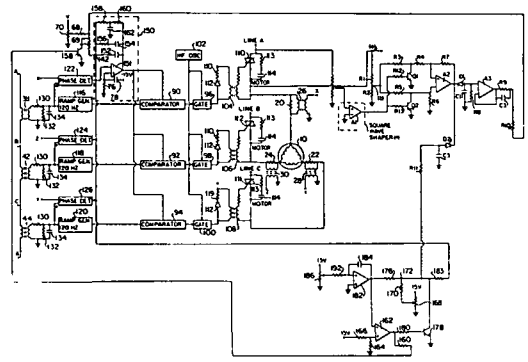


N83-17803*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

THREE PHASE POWER FACTOR CONTROLLER WITH INDUCED EMF SENSING Patent Application

Frank J. Nola, inventor (to NASA) Filed 16 Dec 1982 26 p (NASA-Case-MFS-25852-1; US-Patent-Appl-SN-450319) Avail: NTIS HC A03/MF A01 CSCL 09C

A means is provided for sensing the induced emf produced by an ac induction motor during the time interval in each half cycle when the thyristor is in the 'off state' and for producing a feedback signal for use in controlling switching of the thyristor. For a three phase motor, the sensing means includes. (1) a square wave voltage shaping circuit, connected between the line voltage terminal and an electronic switching circuit, (2) a high gain operational amplifier connected to the motor to neutral voltage terminal through the electronic switching circuit for amplifying and selectively inverting a voltage proportional to the motor to neutral voltage; and (3) a diode for blocking the output of the operational amplifier when this output is of a first polarity. NASA



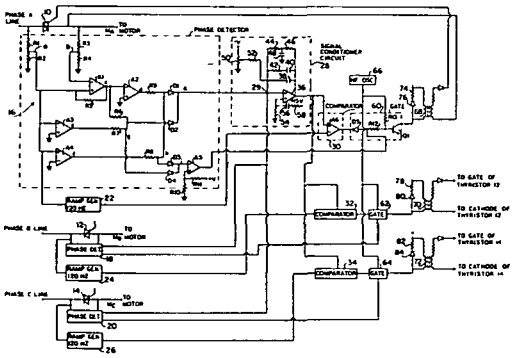
N83-17804*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

PHASE DETECTOR FOR THREE-PHASE POWER FACTOR CONTROLLER Patent Application

Frank J. Nola, inventor (to NASA) Filed 16 Dec. 1982 24 p (NASA-Case-MFS-25854-1; US-Patent-Appl-SN-450166) Avail: NTIS HC A02/MF A01 CSCL 09C

A phase detector for the three phase power factor controller (PFC) is described. The phase detector for each phase includes an operational amplifier which senses the current phase angle for that phase by sensing the voltage across the phase thyristor. Common mode rejection is achieved by providing positive feedback between the input and output of the voltage sensing operational amplifier. This feedback preferably comprises a resistor connected between the output and input of the operational amplifier. The novelty of the invention resides in providing positive feedback such that switching of the operational amplifier is synchronized with switching of the voltage across the thyristor. The invention

provides a solution to problems associated with high common mode voltage and enables use of lower cost components than would be required by other approaches. NASA

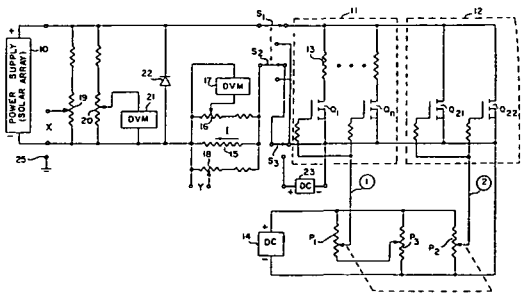


N83-17805*# National Aeronautics and Space Administration. Pasadena Office, Calif.

ELECTRONIC SYSTEM FOR HIGH POWER LOAD CONTROL Patent Application

Emmett L. Miller, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) Filed 24 Dec. 1980 15 p Sponsored by NASA (NASA-Case-NPO-15358-1; US-Patent-Appl-SN-219968) Avail: NTIS HC A02/MF A01 CSCL 09C

An electronic control system for a high power load is provided with a plurality of parallel current paths are divided into two groups with control devices in the current paths of one group each having a current limiting resistor, and control devices in the current paths of the other group each having no current limiting resistor, so that when the control devices of the second group are turned fully on, a short circuit is achieved by the arrangement of parallel current paths. Separate but coordinated control signals are provided by suitable means to first turn on the control devices of the first group and increase their conduction toward saturation as a function of control input, and when fully on, or shortly before, to turn on the control devices of the second group and increase their conduction toward saturation as a function of the control input as that input continues to increase. Electronic means may be employed to generate control signals. The system may be used for I-V characteristic measurements of solar arrays, as well as for other load control purposes. NASA



N83-18996* National Aeronautics and Space Administration. Pasadena Office, Calif

SYNCHRONIZED VOLTAGE CONTRAST DISPLAY ANALYSIS SYSTEM Patent

Merrill F. Johnston (JPL, California Inst. of Tech., Pasadena), Alex Shumka (JPL, California Inst. of Tech , Pasadena), Emmett Miller (JPL, California Inst. of Tech., Pasadena), and Kenneth C. Evans, inventors (to NASA) (JPL, California Inst. of Tech., Pasadena) Issued 9 Nov. 1982 12 p Filed 22 Aug. 1980 Continuation of US Patent Appl. SN-038550, filed 14 May 1979 Sponsored by NASA

(NASA-Case-NPO-14567-1, US-Patent-4,358,732; US-Patent-Appl-SN-180230; US-Patent-Appl-SN-038550; US-Patent-Class-324-73R; US-Patent-Class-250-311; US-Patent-Class-356-394) Avail: US Patent and Trademark Office CSCL 09C

An apparatus and method for comparing internal voltage potentials of first and second operating electronic components such as large scale integrated circuits (LSI's) in which voltage differentials are visually identified via an appropriate display means are described More particularly, in a first embodiment of the invention a first and second scanning electron microscope (SEM) are configured to scan a first and second operating electronic component respectively. The scan pattern of the second SEM is synchronized to that of the first SEM so that both simultaneously scan corresponding portions of the two operating electronic components. Video signals from each SEM corresponding to secondary electron signals generated as a result of a primary electron beam intersecting each operating electronic component in accordance with a predetermined scan pattern are provided to a video mixer and color encoder.

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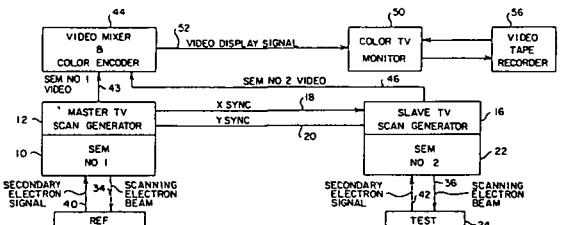


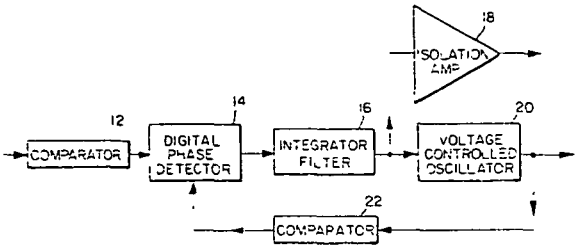
N83-21238*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif

APPARATUS AND METHOD FOR TRACKING THE FUNDAMENTAL FREQUENCY OF AN ANALOG INPUT SIGNAL Patent Application

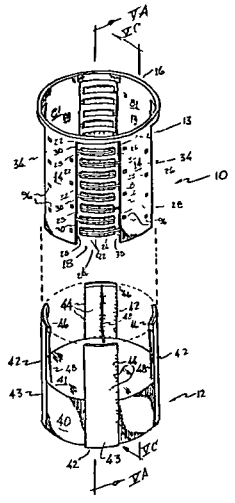
Gerald Temple, inventor (to NASA) Filed 24 Jan. 1983 26 p (NASA-Case-ARC-11367-1; US-Patent-Appl-SN-460511) Avail: NTIS HC A03/MF A01 CSCL 09C

The phase locked loop includes a first comparator for converting only the fundamental analog frequency into a digital input signal, and a voltage controlled oscillator which produces a digital output signal. The input and output signals are fed into a digital

phase detector, which compares the phase of the digital input and output signals, and produces an error signal whose average voltage is proportional to the difference in phase between the input and output signals. An integrator and low pass filter integrates and filters the error signal, which then enters the voltage controlled oscillator. The voltage controlled oscillator produces an output signal whose frequency is proportional to the DC voltage error signal. NASA



fluid within the heat pipes to vary the effective thermal length of the heat pipes in inverse proportion to changes in the temperature of the process fluid. NASA



34 FLUID MECHANICS AND HEAT TRANSFER

Includes boundary layers; hydrodynamics; fluidics; mass transfer, and ablation cooling.

For related information see also *02 Aerodynamics* and *77 Thermodynamics and Statistical Physics.*

N83-12361*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
THERMAL CONTROL SYSTEM Patent Application
Dennis R. Hewitt, inventor (to NASA) Filed 15 Oct. 1982 20 p (NASA-Case-GSC-12771-1; US-Patent-Appl-SN-434672) Avail: NTIS HC A02/MF A01 CSCL 20D

A variable, thermal control system for regulating the temperature of an exothermic process plant carried aboard an Earth orbiting spacecraft is made with a plurality of curved radiator panels arcuately positioned in a circular arrangement to form an open receptacle. A module containing the process is insertable into the receptacle. Heat exchangers having broad exterior surfaces extending axially above the circumference of the module fit within arcuate spacings between adjacent radiator panels. Banks of variable conductance heat pipes partially embedded within and thermally coupled to the radiator panels extend across the arcuate spacings and are thermally coupled to broad exterior surfaces of the heat exchangers by flanges. Temperature sensors monitor the temperature of process fluid flowing from the module through the heat exchangers. Thermal conduction between the heat exchangers and the radiator panels is regulated by heating a control

N83-19015* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
EXTENDED RANGE X-RAY TELESCOPE Patent
Richard B. Hoover, inventor (to NASA) Issued 15 May 1981 6 p Filed 15 May 1981 Supersedes N81-34122 (19 - 24, p 3430) (NASA-Case-MFS-25282-1; US-Patent-4,370,750; US-Patent-Appl-SN-263828; US-Patent-Class-378-43; US-Patent-Class-378-2) Avail: US Patent and Trademark Office CSCL 20D

An X-ray telescope system is described which is comprised of a tubular mount having a collecting region remote from the one axial end. A soft X-ray/XUV subsystem associated with the collecting region directs only relatively soft, near on-axis X-rays/XUV radiation incident on a first portion of the collecting region into a first detector sensitive to relatively soft X-rays/XUV radiation. A hard X-ray subsystem associated with the collecting region directs only relatively hard near on-axis X-rays incident on a second portion of the collecting region into a second detector sensitive to relatively hard X-rays.

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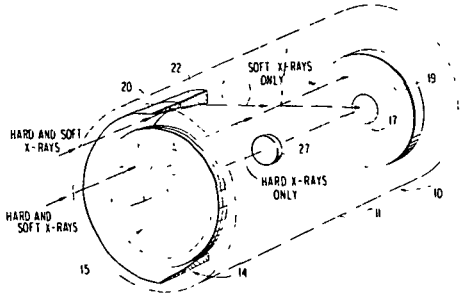


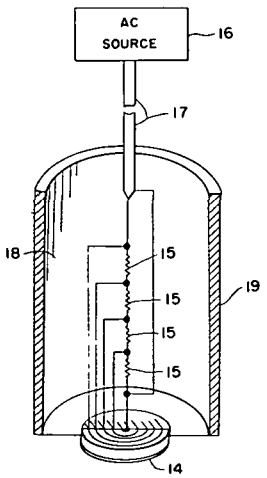
35 INSTRUMENTATION AND PHOTOGRAPHY

Includes remote sensors; measuring instruments and gages; detectors; cameras and photographic supplies; and holography.

For aerial photography see *43 Earth Resources.* For related information see also *06 Aircraft Instrumentation,* and *19 Spacecraft Instrumentation.*

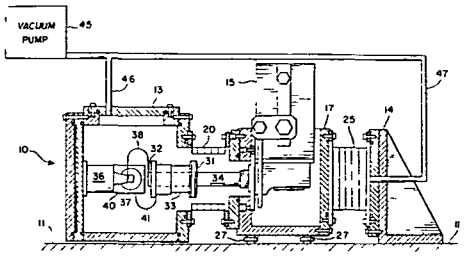
N83-12397*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
ULTRASONIC TRANSDUCER WITH GAUSSIAN RADIAL PRESSURE DISTRIBUTION Patent Application
Richard O. Claus (Virginia Polytechnic Inst. and State Univ.) and Paul S. Zerwekh, inventors (to NASA) (Virginia Polytechnic Inst. and State Univ.) Filed 2 Sep. 1982 11 p Sponsored by NASA (NASA-Case-LAR-12967-1; US-Patent-Appl-SN-414107) Avail: NTIS HC A02/MF A01 CSCL 14B

A piezoelectric crystal has several concentric ring electrodes on one side of the crystal. A resistor network applies different amplitudes of an AC source to each of the several electrodes. A plot of the different amplitudes from the outermost electrode to the innermost electrode is the first half of a Gaussian function. Consequently, the output of the crystal from the side opposite the electrodes has a Gaussian profile. NASA



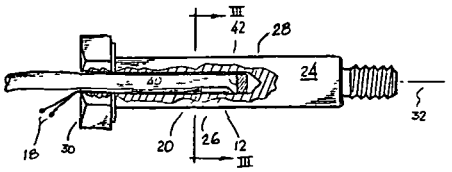
N83-12398*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
VIBRATION ISOLATION AND PRESSURE COMPENSATION APPARATUS FOR SENSITIVE INSTRUMENTATION Patent Application
Robert D. Averill, inventor (to NASA) Filed 16 Aug. 1982 15 p (NASA-Case-LAR-12728-1; US-Patent-Appl-SN-408575) Avail: NTIS HC A02/MF A01 CSCL 14B

A system for attenuating the inherent vibration associated with a mechanical refrigeration unit employed to cryogenically cool sensitive instruments used in measuring chemical constituents of the atmosphere is described. A modular system including an instrument housing and a reaction bracket with a refrigerator unit 'floated' therebetween comprise the instrumentation system. A pair of evacuated bellows the 'float' refrigerator unit and provide pressure compensation at all levels of pressure from sea level to the vacuum of space. Vibration isolators and when needed provide additional vibration damping for the refrigerator unit. A flexible thermal strap (20 K) serves to provide essentially vibration free thermal contact between cold tip of the refrigerator unit and the instrument component mounted on the TDL mount. Another flexible strap (77 K) serves to provide vibration free thermal contact between the TDL mount thermal shroud and a thermal shroud disposed about the thermal shaft. NASA



N83-13424*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
PROCEDURE FOR INTERNALLY MOUNTING STRAIN GAUGES Patent Application
Jay R. Jett, Jr., inventor (to NASA) (Northrop Services, Inc., Greenbelt, Md.) Filed 8 Sep. 1982 12 p Sponsored by NASA (NASA-Case-GSC-12824-1; US-Patent-Appl-SN-415959) Avail: NTIS HC A02/MF A01 CSCL 14B

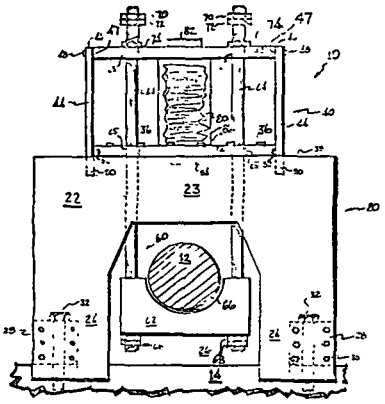
A procedure for mounting a strain gauge inside a hole in a small structural member includes the step of attaching the gauge to a surface of a solid segment conforming to the shape of the hole. A clean gauging area inside the hole is coated with an adhesive and the assembled segment and gauge are inserted into the hole simultaneously with a plugged end of a thin wall, expansible tube. After insertion, the tube is inflated and maintained at a low pressure while the adhesive cures. NASA



N83-13425*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
PORTABLE PALLET WEIGHT APPARATUS Patent Application
Richard M. Day, inventor (to NASA) Filed 19 Aug. 1982 12 p (NASA-Case-GSC-12789-1; US-Patent-Appl-SN-409680) Avail: NTIS HC A02/MF A01 CSCL 14B

A portable device for weighing and determining the horizontal plane center of gravity of the Office of Space Science's integrated flight pallet is described. An assembly for use with several like units in weighing the mass of a loaded cargo pallet supported by its trunnions has a bridge frame for positioning the assembly on a transportation frame carrying the pallet while straddling one trunnion and its trunnion lock, and a cradle assembly for incrementally raising the trunnion. The mass of the trunnion is carried as a

static loading by a slidable bracket mounted upon the bridge frame for supporting the cradle assembly. The bracket applies the static loading to an electrical load cell symmetrically positioned between the bridge frame and the bracket. The static loading compresses the load cell, causing a slight deformation and a potential difference at load cell terminals which is proportional in amplitude to the mass at the trunnion. NASA

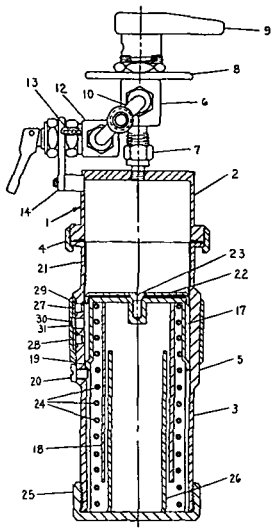


N83-17856*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

SELF-CHARGING METERING AND DISPENSING DEVICE FOR FLUIDS Patent Application

Sonne L. Hooper (Pan American World Airways, Inc., New York) and Drel Setzer, inventors (to NASA) (Pan American World Airways, Inc., New York) Filed 28 Sep. 1982 13 p
(NASA-Case-MSC-20275-1; US-Patent-Appl-SN-425205) Avail: NTIS HC A02/MF A01 CSCL 14B

A predetermined amount of water from the pressurized water source on the shuttle can be measured and dispensed into dehydrated food with minimum effort on the part of the astronaut by using a device comprised of a closed reservoir formed by upper and lower housings which are joined together by retainer rings. The upper housing, containing valve assemblies for attaching the device to the shuttle water supply, has discharge needle. Inside the reservoir, a coil spring co-acts with a piston assembly and the bottom cap of the reservoir. The bottom has a cylindrical guide to maintain alignment of the piston. The spring, whose compressive force of the spring is less than the force exerted by the pressurized water supply, is rather long, providing a relatively constant force over its entire range. The lower housing incorporates a measuring assembly. The astronaut merely sets the amount of fluid desired, moves the valve to fill position, closes the valve, inserts it into the food package, and moves the valve to discharge. NASA

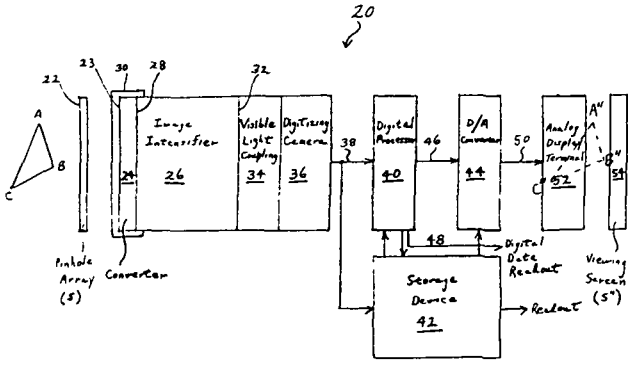


N83-20083*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

THE 3-DIMENSIONAL AND TOMOGRAPHIC IMAGING DEVICE FOR X-RAY AND GAMMA-RAY EMITTING OBJECTS Patent Application

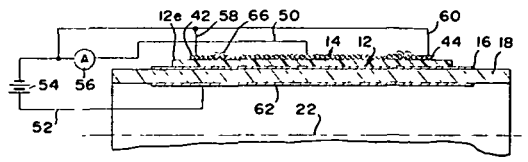
Lo I. Yin, inventor (to NASA) Filed 21 Jan. 1983 20 p
(NASA-Case-GSC-12851-1; US-Patent-Appl-SN-459842) Avail: NTIS HC A02/MF A01 CSCL 14B

An instrument for obtaining quantitative, three-dimensional and tomographic information relating to X-ray and gamma-ray emitting objects and for the orthoscopic viewing of such objects includes a multiple-pinhole aperture plate held spaced from an X-ray or gamma-ray to visible-light converter which is coupled to a visible-light image intensifier. The spacing between the aperture plate and the converter is chosen such that the mini-images of an emitting object formed by the pinholes do not substantially overlap as the impinge on the converter. The output of the image intensifier is digitized by a digitizing camera in terms of position and intensity and fed into a digital computer The computer may output quantitative information relating to the emitting object directly, such as that relating to tomograms, or provide information in analog form when coupled with a suitable viewing device to give an orthoscopic, three-dimensional image of the object. NASA



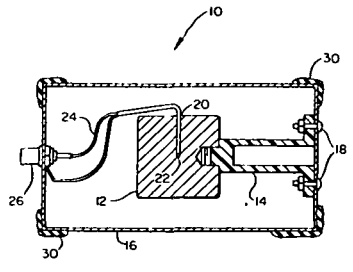
N83-20084*# National Aeronautics and Space Administration. Pasadena Office, Calif.
TRACE WATER SENSOR Patent Application
James B. Stephens, Mary Yang, and Eric G Laue, inventors (to NASA) Filed 14 Jan. 1983 12 p
(Contract NAS7-100)
(NASA-Case-NPO-15722-1; US-Patent-Appl-SN-457992) Avail: NTIS HC A02/MF A01 CSCL 14B

A solid electrolytic hygrometer (a gold foil electrode wrapped about a hollow glass cylinder, a sheet of hygroscopic-electrolytic material wrapped the foil, and a wire wound around the outside of the electrolytic sheet) operated with high reliability while providing rapid and sensitive response. Moisture passing between wire turns was absorbed by the electrolytic material, and dissociated by current passed through the electrolytic material. The cylinder had a slit extending along its length, allowed resilient expansion to press the sheet of electrolytic material firmly against the electrodes. Wire turns lying against one another caused rapid dissociation of moisture. Guard wires also lie at opposite ends of the electrolytic sheet, and currents passing through them avoided moisture buildup at the ends of the main wire coil B.G.



N83-20085# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
TEMPERATURE AVERAGING THERMAL PROBE Patent Application
Lou F. Kalil and Victor S. Reinhardt, inventors (to NASA) Filed 31 Jan. 1983 10 p
(NASA-Case-GSC-12795-1, US-Patent-Appl-SN-462508) Avail: NTIS HC A02/MF A01 CSCL 14B

A thermal probe for averaging temperature fluctuations over a prolonged period is formed with a temperature sensor embedded inside a solid object of a thermally conducting material. The solid object is held in a position equidistantly spaced apart from the interior surfaces of a closed housing by a mount made of a thermally insulating material. The housing is sealed to trap a vacuum or mass of air inside and thereby prevent transfer of heat directly between the environment outside of the housing and the solid object. Electrical leads couple the temperature sensor with a connector on the outside of the housing Other solid objects of different sizes and materials may be substituted for the cylindrically-shaped object to vary the time constant of the probe. NASA



N83-21311* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
MINIATURE SPECTRALLY SELECTIVE DOSIMETER Patent
Richard R. Adams, Ian O. MacConochie, and Bordie D. Poole, Jr., inventors (to NASA) Issued 8 Oct. 1980 7 p Filed 8, Oct. 1980 Supersedes N81-12388 (19-03, p 0346)
(NASA-Case-LAR-12469-1; US-Patent-4,372,680;
US-Patent-Appl-SN-195223; US-Patent-Class-356-51;
US-Patent-Class-250-338; US-Patent-Class-250-372;
US-Patent-Class-250-474.1) Avail: US Patent and Trademark Office CSCL 14B

A miniature spectrally selective dosimeter capable of measuring selected bandwidths of radiation exposure on small mobile areas is described. This is achieved by the combination of photovoltaic detectors, electrochemical integrators (E-cells) and filters in a small compact case which can be easily attached in close proximity to and substantially parallel to the surface being measured. In one embodiment two photovoltaic detectors, two E-cells, and three filters are packaged in a small case with attaching means consisting of a safety pin In another embodiment, two detectors, one E-cell, three filters are packaged in a small case with attaching means consisting of a clip to clip over a side piece of an eye glass frame.

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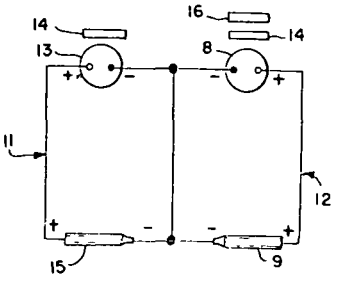

N83-21312* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
COMPRESSION TEST APPARATUS Patent
George C. Shanks, inventor (to NASA) Issued 13 Feb. 1981 5 p Filed 13 Feb. 1981 Supersedes N81-24470 (19 - 15, p 2067)
(NASA-Case-MSC-18723-1; US-Patent-4,377,089;
US-Patent-Appl-SN-234223; US-Patent-Class-73-818) Avail: US Patent and Trademark Office CSCL 14B

An apparatus for compressive testing of a test specimen may comprise vertically spaced upper and lower platen members between which a test specimen may be placed. The platen members are supported by a fixed support assembly. A load indicator is interposed between the upper platen member and the support assembly for supporting the total weight of the upper platen member and any additional weight which may be placed on it. Operating means are provided for moving the lower platen member upwardly toward the upper platen member whereby an

increasing portion of the total weight is transferred from the load indicator to the test specimen.
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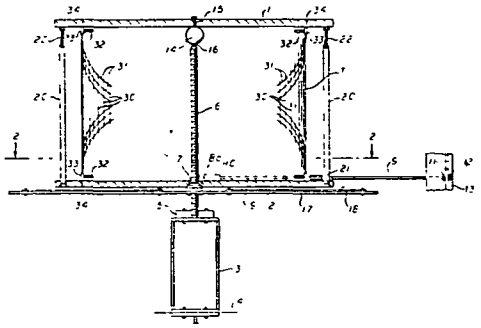
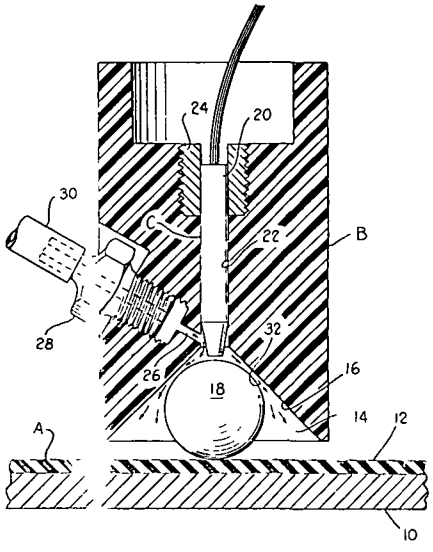


N83-21316*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
APPARATUS AND METHOD FOR INSPECTING A BEARING BALL Patent Application
Benjamin F. Bankston, inventor (to NASA) Filed 9 Mar. 1983 14 p
(NASA-Case-MFS-25833-1, US-Patent-Appl-SN-473827) Avail: NTIS HC A02/MF A01 CSCL 14B

A method and apparatus for inspecting the surface of a bearing ball is disclosed which includes a base having a high friction non-abrasive base scanning surface A holding device includes a cone-shaped cup recess in which a ball element is received. Air is introduced through a passage to relieve friction between the wall of the recess and the ball element and facilitate rolling of the ball over the high friction base surface. The holding device is moved over the base scanning surface in a predetermined pattern such that the entire surface of the ball element is inspected by an eddy current probe which detects any surface defects NASA

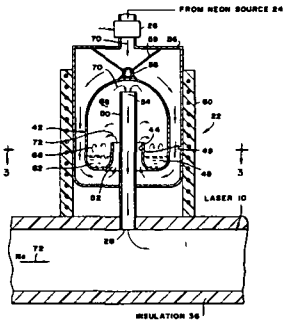


36 LASERS AND MASERS

Includes parametric amplifiers.

N83-10417* National Aeronautics and Space Administration. Pasadena Office, Calif.
METHOD AND APPARATUS FOR CONVECTION CONTROL OF METALLIC HALIDE VAPOR DENSITY IN A METALLIC HALIDE LASER Patent
Thomas J. Pivirotto, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) Issued 14 Mar. 1980 8 p Filed 14 Mar. 1980 Supersedes N80-20574 (18 - 11, p 1421) Sponsored by NASA (NASA-Case-NPO-15021-1; US-Patent-4,347,613; US-Patent-Appl-SN-130496; US-Patent-Class-372-56; US-Patent-Class-372-59; US-Patent-Class-372-60) Avail: US Patent and Trademark Office CSCL 20E

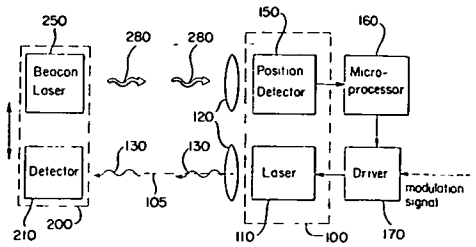
An apparatus is disclosed in which a reservoir containing copper chloride is heated so that the copper chloride is maintained in a liquid form. The apparatus includes a means for flowing a buffer gas (which in the exemplary embodiment is neon) over the liquid copper chloride to provide a mixture of copper chloride vapor and neon above the liquid copper chloride. A conduit provides fluid communication between the reservoir containing the copper chloride vapor/neon mixture and the laser. The copper chloride vapor density in the laser is related to the liquid copper chloride temperature and the neon flow rate through the reservoir. In accordance with a further feature of the exemplary embodiment, neon is also provided directly to the laser in order to provide a further means of controlling the copper chloride vapor density in the laser.Official Gazette of the U.S. Patent and Trademark Office



N83-20092*# National Aeronautics and Space Administration. Pasadena Office, Calif.
INTEGRATED OPTO-ELECTRONIC LASER BEAM DEFLECTOR POSITION DETECTOR Patent Application
Joseph Katz (JPL, California Inst. of Tech., Pasadena), James R. Lesh (JPL, California Inst. of Tech., Pasadena), and Richard M. Dickinson, inventors (to NASA) (JPL, California Inst. of Tech., Pasadena) Filed 15 Nov. 1982 13 p
(Contract NAS7-100)
(NASA-Case-NPO-15943-1; US-Patent-Appl-SN-441898) Avail. NTIS HC A02/MF A01 CSCL 20E

A monolithic integrated optoelectronic circuit chip is disclosed comprising a semiconductor injector laser and a photoelectric sensor. The chip is suitable for use in an optical communication system employing a laser transmitter and an optical detector/receiver. The chip laser is adapted for electronic deflection of the beam. The chip is utilized in conjunction with an external beacon laser disposed at the optical receiver. The photoelectric sensor is adapted to receive light emitted by the beacon laser, and to

generate position signal indicative of the angular position of the beacon relative to the chip. An electronic controller is responsive to the position signals and directs the deflection of the beam so that the chip laser beam is aligned with the optical receiver. NASA

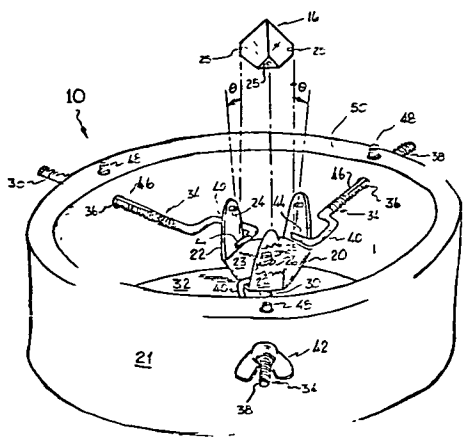


37 MECHANICAL ENGINEERING

Includes auxiliary systems (non-power); machine elements and processes; and mechanical equipment.

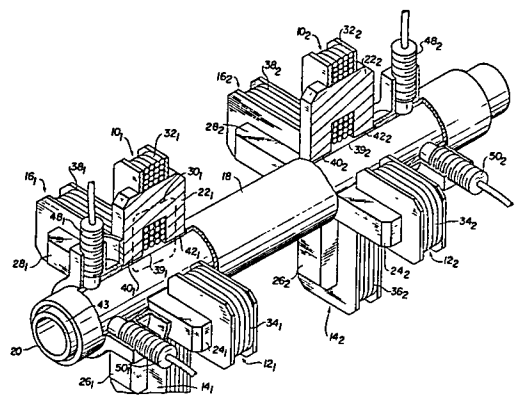
N83-12434*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
TOOL FOR RELEASING OPTICAL ELEMENTS Patent Application
Jeffery S. Gum, inventor (to NASA) Filed 30 Sep. 1982 4 p
(NASA-Case-GSC-12794-1; US-Patent-Appl-SN-431421) Avail: NTIS HC A02/MF A01 CSCL 13I

An optical element mounted between the spring arms of a bracket can be released by using a tool which has a housing forming a cavity and hook shaped distal sections of several elongate members. These members extend into the cavity through the housing to engage the spring arms. Threaded proximal sections of the elongate members are drawn through holes in the housing by adjustment of fasteners on the exterior of the housing, thereby pulling the hook shaped sections outward and causing the spring arms to be spread apart to release the optical element. NASA



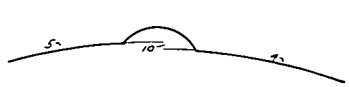
N83-13460*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
LINEAR MAGNETIC BEARINGS Patent Application
Michael P. Goldowsky, inventor (to NASA) (North American Phillips Corp., Briarcliff Manor, N.Y.) Filed 8 Sep. 1982 19 p Sponsored by NASA
(NASA-Case-GSC-12582-2; US-Patent-Appl-SN-415960) Avail: NTIS HC A02/MF A01 CSCL 13I

A magnetic bearing for supporting a linear armature member in suspension includes an elongated cylindrical housing having two sets of U shaped stationary electromagnets, and position sensors respectively located at each end of the housing. Each set of electromagnets preferably consists of four electromagnet assemblies located 90 deg apart around the periphery of the housing and are operable to generate four orthogonal magnetic fields within the housing. Each set of position sensors are aligned with the electromagnets to define two orthogonal horizontal and vertical axes from which signals proportional to orthogonal shaft displacement are provided. NASA



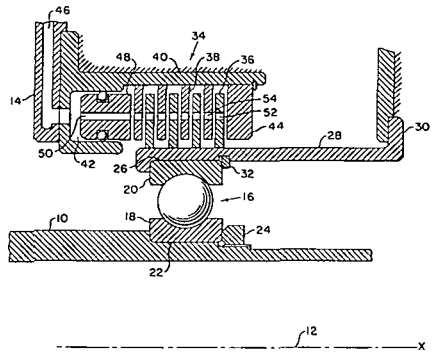
N83-17882*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
X-RAY DETERMINATION OF PARTS ALIGNMENT Patent Application
Charles W. Nelson, inventor (to NASA) (Beech Aircraft Corp., Wichita, Kans.) Filed 2 Nov 1982 11 p Sponsored by NASA
(NASA-Case-MSC-20418-1; US-Patent-Appl-SN-438446) Avail. NTIS HC A02/MF A01 CSCL 22B

A method for determining the alignment of adjoining metal objects is provided. The method comprises producing an X-ray image of adjoining surfaces of the two metal objects. The X-ray beam is tangential to the point the surfaces are joined. The method is particularly applicable where the alignment of the two metal objects is not readily susceptible to visual inspection. NASA



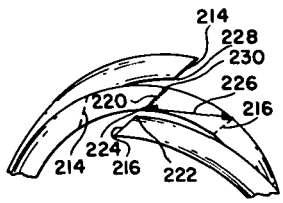
N83-17883*# National Aeronautics and Space Administration. *Lewis Research Center, Cleveland, Ohio.*
MULTIPLE PLATE HYDROSTATIC VISCOUS DAMPER Patent Application
L. P. Ludwig, inventor (to NASA) Filed 10 Jan. 1983 9 p
(NASA-Case-LEW-13445-2; US-Patent-Appl-SN-456929) Avail: NTIS HC A02/MF A01 CSCL 13I

The damping radial motion of a rotating shaft is addressed. The damper comprises a series of spaced plates extending in a radial direction. A hydraulic piston is utilized to place a load in these plates. Each annular plate is provided with a suitable hydrostatic bearing geometry on at least one of its faces. This structure provides a high degree of dampening in a rotor case system of turbomachinery in general. The damper is particularly useful in gas turbine engines. NASA



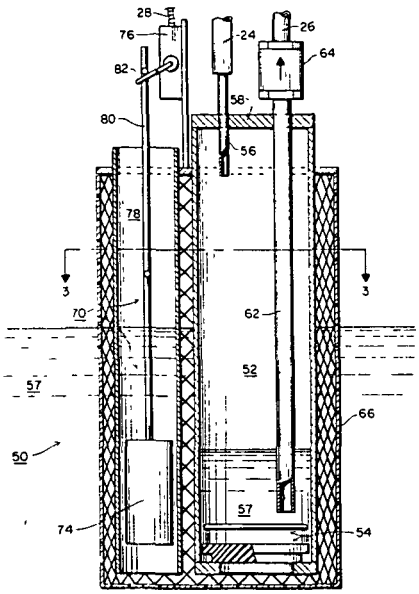
N83-19091* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
MODIFIED SPIRAL WOUND RETAINING RING Patent
Ashby G. Lawson, inventor (to NASA) Issued 29 Aug. 1980 4 p Filed 29 Aug. 1980 Supersedes N81-12422 (19 - 03, p 0351)
(NASA-Case-LAR-12361-1; US-Patent-4,371,301; US-Patent-Appl-SN-182880; US-Patent-Class-411-517; US-Patent-Class-411-353) Avail: US Patent and Trademark Office CSCL 13I

A spiral wound retaining ring with angled ends is described. The ring is crimped at the same angle as the ring ends to maintain a constant thickness dimension. The angling of the ends of the ring and crimp allow the ends to be positioned closer together while maintaining enough clearance to enable insertion and removal of the ring. By reducing the separation distance between the ends a stronger ring results since the double layer area of the ring is maximized.
Official Gazette of the U.S. Patent and Trademark Office



N83-20152*# National Aeronautics and Space Administration. *Ames Research Center, Moffett Field, Calif.*
FLUID DRIVEN SUMP PUMP Patent Application
Gary D Nolt, inventor (to NASA) Filed 28 Jan. 1983 13 p
(NASA-Case-ARC-11414-1, US-Patent-Appl-SN-461714) Avail: NTIS HC A02/MF A01 CSCL 13K

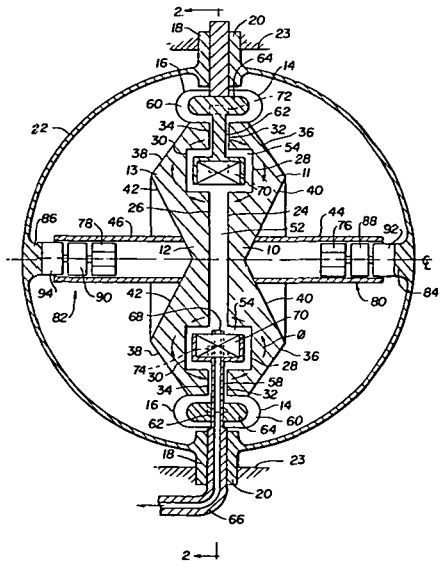
A sump pump was adapted for use in a sump with insufficient dimensions to accommodate an electric motor and a pump When liquid rose to a predetermined level, a float tripped a switch that energized a solenoid controlled valve to a surface located air supply at, e g., 120 psi. Air was provided through hose from the surface to a chamber in the pump that was filled or partially filled with water or other liquid, which entered through check valve. The air drove the water up an outlet to the surface. A timer closed the solenoid controlled air valve at predetermined intervals to allow refilling of the chamber by water or other liquid surrounding the chamber until the liquid dropped below the predetermined level and switch was opened by float B.G.



N83-20153*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
MAGNETICALLY ACTUATED COMPRESSOR Patent Application
Philip A Struder and Jack Evans, inventors (to NASA) Filed 28 Jan 1983 17 p
(NASA-Case-GSC-12799-1, US-Patent-Appl-SN-461724) Avail: NTIS HC A02/MF A01 CSCL 13I

A vibration free fluid compressor was adapted for Stirling cycle cryogenic refrigeration apparatus comprising a pair of identical opposing ferromagnetic pistons located in a housing and between a gas spring including a sealed volume of a working fluid such as gas under pressure. The gas compresses and expands in accordance with movement of the pistons to generate a compression wave which can be vented out to other apparatus, for example, a displacer unit in a Stirling cycle engine. The pistons are urged outwardly due to the pressure of the gas, however, a fixed

electromagnetic coil assembly, located in the housing adjacent the pistons, is periodically energized to produce a magnetic field which interlinks the pistons in such a fashion that the pistons are mutually attracted to one another NASA



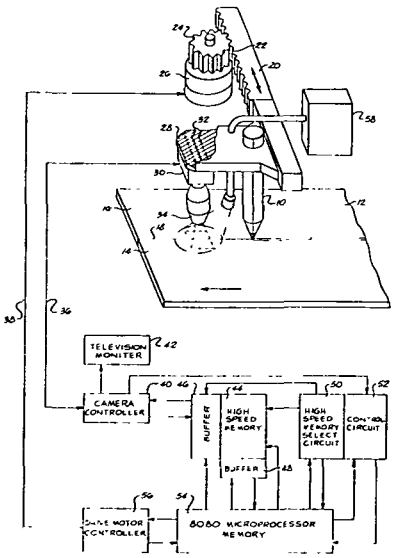
N83-20154*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

AUTOMATIC WELD TORCH GUIDANCE CONTROL SYSTEM Patent Application

Hubert E. Smith, William A Wall, and Morrison R Burns, Jr., inventors (to NASA) Filed 25 Jan. 1983 18 p

(NASA-Case-MFS-25807; US-Patent-Appl-SN-460733) Avail: NTIS HC A02/MF A01 CSCL 13I

A device for automatically controlling the movement of a welding torch while welding an elongated joint is described. A charge injection television camera is carried on a movable support and includes a matrix of individual light sensing video elements (pixels) which generate voltages responsive to light reflected off of the joint and surrounding areas of the workpiece. The voltages produced by the pixels are converted to digital words which are fed to a microprocessor for generating an error signal. This error signal is fed to a digital motor which is used to drive a movable support upon which the television camera is carried. NASA



N83-20155*# National Aeronautics and Space Administration. Pasadena Office, Calif.

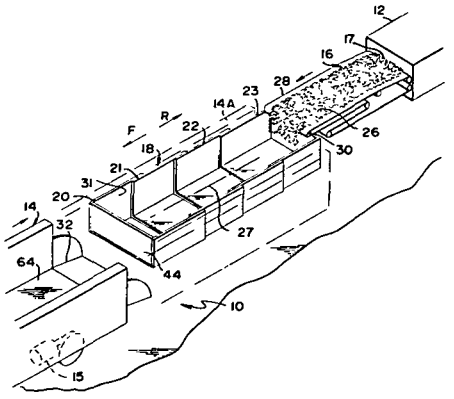
HIGH PRODUCTION SHUTTLE CAR SYSTEM FOR COAL MINES Patent Application

Earl Collins, Jr., inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) Filed 14 Jan. 1983 13 p

(Contract NAS7-100)

(NASA-Case-NPO-15949-1; US-Patent-Appl-SN-457990) Avail: NTIS HC A02/MF A01 CSCL 13I

A system is described for loading newly mined material such as coal, into a shuttle car, at a location near the mine face where there is only a limited height available for a loading system. The system includes a storage bin having several telescoping bin sections, and a shuttle car having a bottom wall that can move under the bin With the bin in an extended position and filled with coal, the bin sections can be telescoped to allow the coal to drop out of the bin sections and into the shuttle car, to quickly load the car. The bin sections can then be extended, so they can be slowly filled with more coal while awaiting another shuttle car. NASA



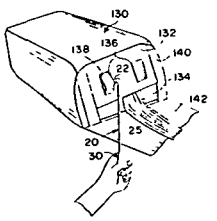
N83-20156*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va

LINE HOOK WITH LOOP EXPANDER Patent Application

Gary B Bayless, inventor (to NASA) (Army Structures Lab., Hampton, Va.) Filed 25 Feb 1983 12 p

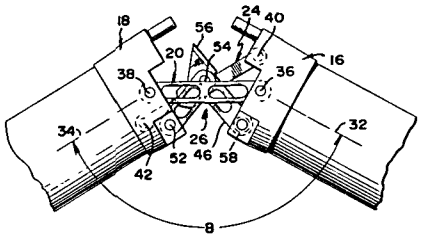
(NASA-Case-LAR-12875-1, US-Patent-Appl-SN-469865) Avail: NTIS HC A02/MF A01 CSCL 13I

This invention describes a line hook with loop expander. The tool is comprised of a line hook, which is a piece of rod with a hook or other grasping device at one end and a handle at the other end, and on which is slidably mounted a loop expander. The loop expander has a tapered end which is pulled through a locking loop of a parachute pack, causing the locking loop to expand so that the parachute shroud lines may be easily pulled through by the grasping device in one simple operation. B.G.



N83-20157*# National Aeronautics and Space Administration. Pasadena Office, Calif.
ARTICULATED JOINT FOR DEPLOYABLE STRUCTURES Patent Application
Norwood D. Craighead (JPL, California Inst. of Tech., Pasadena), Richard J. Preliasco (JPL, California Inst. of Tech., Pasadena), and Timothy D. Hult, inventors (to NASA) (JPL, California Inst. of Tech, Pasadena) 25 Feb. 1983 12 p
(Contract NAS7-100)
(NASA-Case-NPO-16038-1; US-Patent-Appl-SN-469864) Avail: NTIS HC A02/MF A01 CSCL 13I

A joint is described for connecting a pair of beams to pivot them between positions in alignment or beside one another, which is of light weight and which operates in a controlled manner. The joint includes a pair of fittings and at least one center link having opposite ends pivotally connected to opposite fittings and having axes that pass through centerplanes of the fittings. A control link having opposite ends pivotally connected to the different fittings controls their relative orientations, and a toggle assembly holds the fittings in the deployed configuration wherein they are aligned. The fittings have stops that lie on one side of the centerplane opposite the toggle assembly NASA



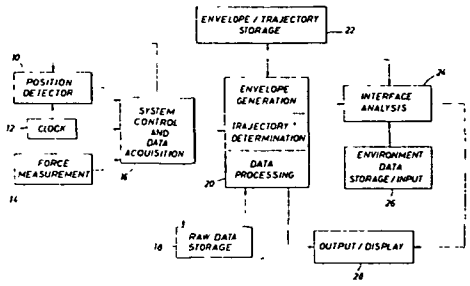
39 STRUCTURAL MECHANICS

Includes structural element design and weight analysis; fatigue; and thermal stress.

For applications see *05 Aircraft Design, Testing and Performance* and *18 Spacecraft Design, Testing and Performance.*

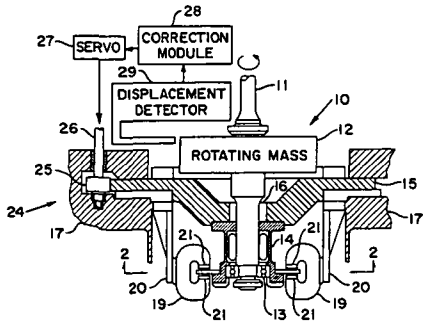
N83-20280* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
KINESIMETRIC METHOD AND APPARATUS Patent
William E Thornton, inventor (to NASA) Issued 17 Oct. 1980 18 p Filed 17 Oct. 1980 Supersedes N81-15699 (19 - 06, p 0808)
(NASA-Case-MSC-18929-1; US-Patent-4,375,674; US-Patent-Appl-SN-198093; US-Patent-Class-364-559; US-Patent-Class-364-522; US-Patent-Class-364-413; US-Patent-Class-73-379; US-Patent-Class-128-782; US-Patent-Class-358-105) Avail: US Patent and Trademark Office CSCL 20K

Apparatus and method for the determination of functional capability of bodies are disclosed. Reach as well as velocity, acceleration and force generation at various positions may be determined for a body by a three dimensional kinesimeter equipped with an ergometer. A general data package indicative of performance potential of a subject body or collection of bodies is provided for interfacing with data characteristics of various environments.
Official Gazette of the U S. Patent and Trademark Office



N83-20284*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
VARIABLE FORCE, EDDY-CURRENT OR MAGNETIC DAMPER Patent Application
Robert E. Cunningham, inventor (to NASA) Filed 3 Feb. 1983 11 p
(NASA-Case-LEW-13717-1; US-Patent-Appl-SN-463456) Avail: NTIS HC A02/MF A01 CSCL 20K

Variable damping for resonant vibrations which may occur at different rotational speeds in the range of rpms in which a rotating machine is operated is provided. A variable force damper includes a rotating mass carried on a shaft which is supported by a bearing in a resilient cage. The cage is attached to a support plate whose rim extends into an annular groove in a housing. Variable damping is effected by tabs of electrically conducting, nonmagnetic material which extend radially from the cage. The tabs at an index position lie between the pole faces of respective C shaped magnets. The magnets are attached by cantilever spring members to the housing. By rotating the support plate about the axis of the shaft, the tabs may be rotated through an angle 0 of about 40 deg away from the index or 0 deg position. At the 40 deg position minimum damping is obtained. NASA



43 EARTH RESOURCES

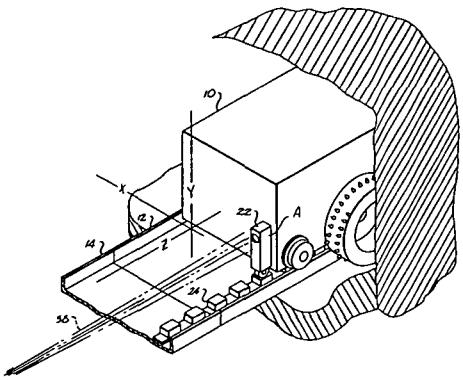
Includes remote sensing of earth resources by aircraft and spacecraft; photogrammetry; and aerial photography.

For instrumentation see *35 Instrumentation and Photography.*

N83-14607*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
LONGWALL SHEARER TRACKING SYSTEM Patent Application

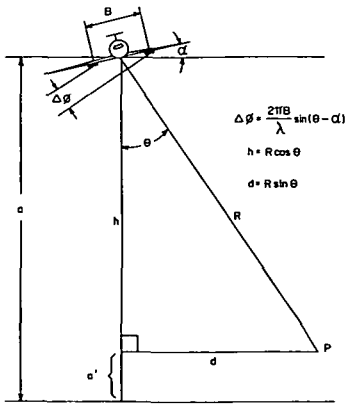
Peter D. Poulsen (Adjunct Systems, Inc.), Richard J. Stein, and Robert E. Pease, inventors (to NASA) Filed 15 Nov. 1982 20 p (Contract NAS8-34185)
(NASA-Case-MFS-25717-1; US-Patent-Appl-SN-441897) Avail: NTIS HC A02/MF A01 CSCL 08I

A tracking system for measuring and recording the movements of a longwall shearer vehicle includes an optical tracking assembly carried at one end of a desired vehicle path and a retroreflector assembly carried by the vehicle. Continuous horizontal and vertical light beams are alternately transmitted by means of a rotating Dove prism to the reflector assembly. A vertically reciprocating reflector interrupts the continuous light beams and converts these to discrete horizontal and vertical light beam images transmitted at spaced intervals along the path. A second rotating Dove prism rotates the vertical images to convert them to a second series of horizontal images while the first mentioned horizontal images are left unrotated and horizontal. NASA



N83-20324*# National Aeronautics and Space Administration. Pasadena Office, Calif.
METHOD AND APPARATUS FOR CONTOUR MAPPING USING SYNTHETIC APERTURE RADAR Patent Application
Richard M. Goldstein (JPL, California Inst. of Tech., Pasadena), Edward R. Caro (JPL, California Inst. of Tech., Pasadena), and Chialin Wu, inventors (to NASA) (JPL, (California Inst. of Tech., Pasadena) Filed 10 Feb. 1983 17 p
(Contract NAS7-100)
(NASA-Case-NPO-15939-1; US-Patent-Appl-SN-465365) Avail: NTIS HC A02/MF A01 CSCL 08B

By using two SAR antennae spaced a known distance and oriented at substantially the same look angle to illuminate the same target area, pixel data from the two antennae are compared in phase to determine a difference from which a slant angle is determined for each pixel point. The height of each pixel point from the aircraft is determined, and from the known altitude of the aircraft above sea level, the altitude (elevation) of each point is determined. NASA



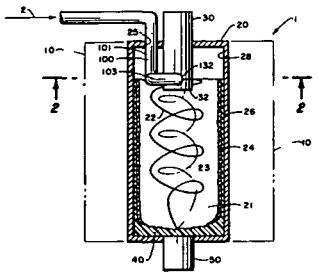
44 ENERGY PRODUCTION AND CONVERSION

Includes specific energy conversion systems, e.g., fuel cells and batteries; global sources of energy; fossil fuels; geophysical conversion, hydroelectric power; and wind power.

For related information see also *07 Aircraft Propulsion and Power, 20 Spacecraft Propulsion and Power, 28 Propellants and Fuels,* and *85 Urban Technology and Transportation.*

N83-10501* National Aeronautics and Space Administration. Pasadena Office, Calif.
THERMAL REACTOR Patent
Harry Levin (JPL, California Inst. of Technology, Pasadena) and Larry B. Ford, inventors (to NASA) (JPL, California Inst. of Technology, Pasadena) Issued 29 Feb. 1980 9 p Filed 29 Feb. 1980 Supersedes N80-20338 (80 - 11, p 1389) Sponsored by NASA
(NASA-Case-NPO-14369-1; US-Patent-4,343,772; US-Patent-Appl-SN-126063; US-Patent-Class-422-200; US-Patent-Class-422-202; US-Patent-Class-422-224; US-Patent-Class-55-204) Avail: US Patent and Trademark Office CSCL 10A

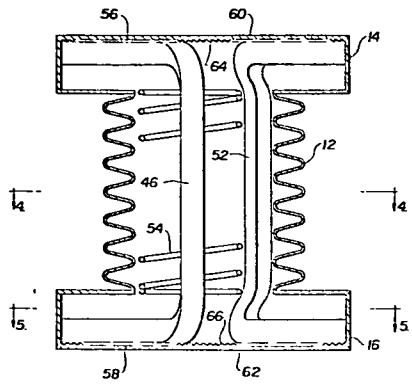
A thermal reactor apparatus and method of pyrolyticaly decomposing silane gas into liquid silicon product and hydrogen by-product gas is disclosed. The thermal reactor has a reaction chamber which is heated well above the decomposition temperature of silane. An injector probe introduces the silane gas tangentially into the reaction chamber to form a first, outer, forwardly moving vortex containing the liquid silicon product and a second, inner, rewardly moving vortex containing the by-product hydrogen gas. The liquid silicon in the first outer vortex deposits onto the interior walls of the reaction chamber to form an equilibrium skull layer which flows to the forward or bottom end of the reaction chamber where it is removed. The by-product hydrogen gas in the second inner vortex is removed from the top or rear of the reaction chamber by a vortex finder. The injector probe which introduces the silane gas into the reaction chamber is continually cooled by a cooling jacket. Official Gazette of the U.S. Patent and Trademark Office



N83-12525*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
HEAT PIPE THERMAL SWITCH Patent Application
David A. Wolf, Inventor (to NASA) (Dynatherm Corp.) Filed 15 Oct. 1982 12 p Sponsored by NASA
(NASA-Case-GSC-12812-1; US-Patent-Appl-SN-434674) Avail: NTIS HC A02/MF A01 CSCL 10A

A thermal switch for controlling the dissipation of heat between a body acting as a heat source, and a heat sink is presented. The thermal switch is comprised of a flexible bellows defining an expansible vapor chamber for a working fluid located between an

evaporation and condensation chamber. Inside the bellows is located a coiled retaining spring and four axial metal mesh wicks, two of which have their central portions located inside of the spring while the other two have their central portions located between the spring and the side wall of the bellows. The wicks are terminated and are attached to the inner surfaces of the outer end walls of evaporation and condensation chambers respectively located adjacent the heat source and heat sink. NASA



N83-13579* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

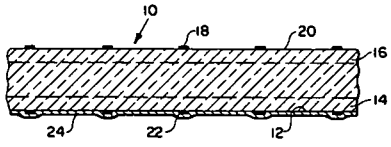
SOLAR CELL HAVING IMPROVED BACK SURFACE REFLECTOR Patent

An-Ti Chai, inventor (to NASA) Issued 19 Oct. 1982 5 p Filed 11 Mar. 1981

(NASA-Case-LEW-13620-1; US-Patent-4,335,196; US-Patent-Appl-SN-242796; US-Patent-Class-136-259; US-Patent-Class-29-572; US-Patent-Class-136-256; US-Patent-Class-357-30; US-Patent-Class-427-88; US-Patent-Class-427-89; US-Patent-Class-427-90; US-Patent-Class-427-91) Avail: US Patent and Trademark Office CSCL 10A

The operating temperature is reduced and the output of a solar cell is increased by using a solar cell which carries electrodes in a grid finger pattern on its back surface. These electrodes are sintered at the proper temperature to provide good ohmic contact. After sintering, a reflective material is deposited on the back surface by vacuum evaporation. Thus, the application of the back surface reflector is separate from the back contact formation. Back surface reflectors formed in conjunction with separate grid finger configuration back contacts are more effective than those formed by full back metallization of the reflector material.

Official Gazette of the U.S. Patent and Trademark Office



N83-14692* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio

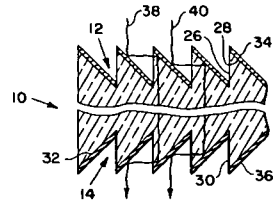
HEAT TRANSPARENT HIGH INTENSITY HIGH EFFICIENCY SOLAR CELL Patent

John C. Evans, Jr., inventor (to NASA) Issued 15 May 1981 7 p Filed 15 May 1981 Supersedes N81-27598 (19 - 18, p 2506)

(NASA-Case-LEW-12892-1; US-Patent-4,360,701; US-Patent-Appl-SN-264380; US-Patent-Class-136-259; US-Patent-Class-136-255; US-Patent-Class-136-256) Avail: US Patent and Trademark Office CSCL 10A

An improved solar cell design is described. A surface of each solar cell has a plurality of grooves. Each groove has a vertical face and a slanted face that is covered by a reflecting metal. Light rays are reflected from the slanted face through the vertical face where they traverse a photovoltaic junction. As the light rays travel to the slanted face of an adjacent groove, they again traverse the junction. The underside of the reflecting coating directs the light rays toward the opposite surface of solar cell as they traverse the junction again. When the light rays travel through the solar cell and reach the saw toothed grooves on the under side, the process of reflection and repeatedly traversing the junction again takes place. The light rays ultimately emerge from the solar cell. These solar cells are particularly useful at very high levels of insolation because the infrared or heat radiation passes through the cells without being appreciably absorbed to heat the cell.

Official Gazette of the U.S. Patent and Trademark Office



N83-14693* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

GAS-TO-HYDRAULIC POWER CONVERTER Patent

Charles W. Galloway, inventor (to NASA) Issued 27 Feb. 1981 7 p Filed 27 Feb. 1981 Supersedes N81-24445 (19 - 15, p 2063)

(NASA-Case-MSC-18794-1; US-Patent-4,360,325; US-Patent-Appl-SN-238785; US-Patent-Class-417-399; US-Patent-Class-74-110) Avail: US Patent and Trademark Office CSCL 10B

A gas piston driven hydraulic piston pump is described in which the gas cycle is of high efficiency by injecting the gas in slugs at the beginning of each power stroke. The hydraulic piston is disposed to operate inside the as piston, and the two pistons, both slidably but nonrotatably mounted, are coupled together with a rotating but non-sliding motion transfer ring extending into antifriction grooves in the sidewalls of the two pistons. To make the hydraulic piston move at a constant speed during constant hydraulic horsepower demand and thus exert a constant pressure on the hydraulic fluid, these grooves are machined with variable pitches and one is the opposite of the other, i.e., the gas piston groove increases in pitch during its power stroke while the hydraulic piston groove decreases. Any number of piston assembly sets may be used to obtain desired hydraulic horsepower.

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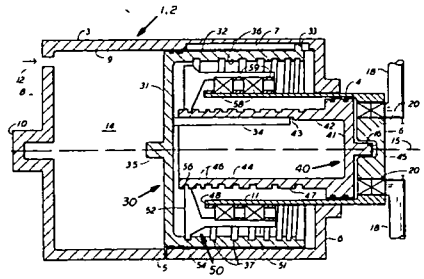
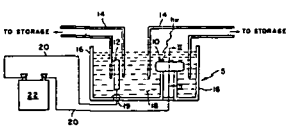


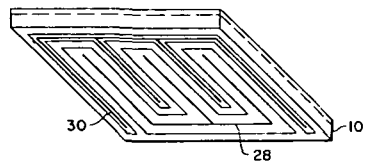
N83-18025*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
CHALCOGENOPHOSPHATE PHOTOELECTRODES Patent Application
Benjamin Reichman (Christopher Newport Coll.) and Charles E. Byvik, inventors (to NASA) Filed 7 Oct. 1982 14 p
(NASA-Case-LAR-12958-1; US-Patent-Appl-SN-433196) Avail: NTIS HC A02/MF A01 CSCL 10A

A device for converting light energy into other forms of useful energy such as electrical or chemical energy is described. A photoelectrode is manufactured from a layered chalcogenophosphate (MPX3) compound employed in a photoelectrochemical cell where M is selected from the group consisting of the transition metal series of elements beginning with scandium (atomic number 21) through germanium (atomic number 32), yttrium (atomic number 39) through antimony (atomic number 51), and lanthanum (atomic number 57) through polonium (atomic number 84); P is phosphorus; and X is selected from the chalogenide series consisting of sulfur, selenium, and tellerium. The photoelectrochemical cell is comprised of a container which retains an acidic electrolyte solution, an MPX3 photoelectrode, and a counterelectrode. In the preferred embodiment, the photoelectrochemical cell is set up as a photoelectrolysis cell. NASA



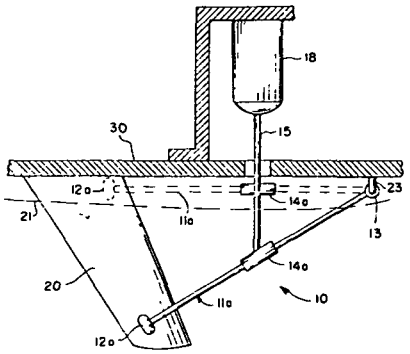
N83-20374*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
SCREEN PRINTED INTERDIGITATED BACK CONTACT SOLAR CELL Patent Application
C. R. Baraona, George A. Mazaris, and An-Ti Chai, inventors (to NASA) Filed 10 Feb. 1983 8 p
(NASA-Case-LEW-13414-1; US-Patent-Appl-SN-465364) Avail: NTIS HC A02/MF A01 CSCL 10A

Interdigitated back contact solar cells were made by screen printing dopant materials onto the back surface of a semiconductor substrate in a pair of interdigitated patterns. These dopant materials were then diffused into the substrate to form junctions having configurations corresponding to these patterns. Contacts having configurations which match the patterns were then applied over the junctions. NASA



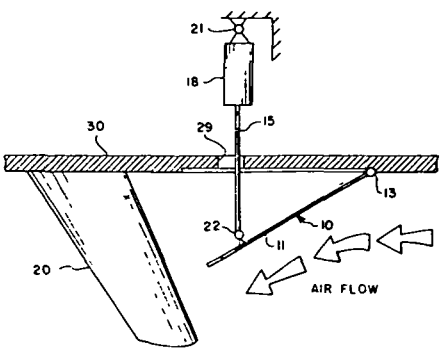
N83-21503* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
AEROELASTIC INSTABILITY STOPPERS FOR WIND TUNNEL MODELS Patent
Robert V. Doggett, Jr. and Rodney H. Ricketts, inventors (to NASA) Issued 17 Jun. 1981 4 p Filed 17 Jun 1981 Supersedes N81-31230 (19 - 22, p 3020)
(NASA-Case-LAR-12458-1; US-Patent-4,372,158; US-Patent-Appl-SN-274705, US-Patent-Class-73-147) Avail: US Patent and Trademark Office CSCL 10A

A mechanism for constraining models or sections thereof, was wind tunnel tested, deployed at the onset of aeroelastic instability, to forestall destructive vibrations in the model is described. The mechanism includes a pair of arms pivoted to the tunnel wall and straddling the model. Rollers on the ends of the arms contact the model, and are pulled together against the model by a spring stretched between the arms An actuator mechanism swings the arms into place and back as desired.
Official Gazette of the U.S. Patent and Trademark Office



N83-21504* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
AEROELASTIC INSTABILITY STOPPERS FOR WIND TUNNEL MODELS Patent
Robert V Doggett, Jr and Rodney H Ricketts, inventors (to NASA) Issued 17 Jun. 1981 6 p Filed 17 Jun 1981 Supersedes N81-31229 (19 - 22, p 3020)
(NASA-Case-LAR-12720-1; US-Patent-4,372,159, US-Patent-Appl-SN-274706, US-Patent-Class-73-147) Avail: US Patent and Trademark Office CSCL 10A

A mechanism for diverting the flow in a wind tunnel from the wing of a tested model is described. The wing is mounted on the wall of a tunnel. A diverter plate is pivotally mounted on the tunnel wall ahead of the model. An actuator fixed to the tunnel is pivotably connected to the diverter plate, by plunger. When the model is about to become unstable during the test the actuator moves the diverter plate from the tunnel wall to divert maintaining stable model conditions. The diverter plate is then retracted to enable normal flow.
Official Gazette of the U.S. Patent and Trademark Office



45 ENVIRONMENT POLLUTION

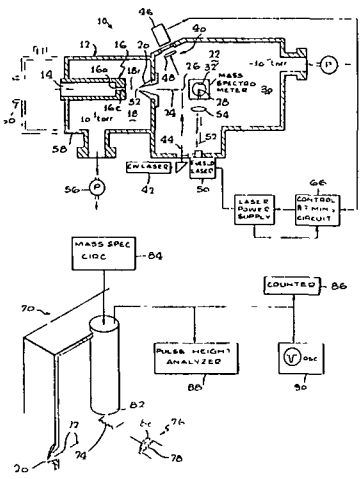
Includes air, noise, thermal and water pollution, environment monitoring; and contamination control.

N83-18089*# National Aeronautics and Space Administration. Pasadena Office, Calif.

PARTICLE ANALYZING METHOD AND APPARATUS Patent Application

Mahadeva P. Sinha (JPL, California Inst. of Tech., Pasadena), Charles E. Giffin (JPL, California Inst. of Tech., Pasadena), David D. Norris (JPL, California Inst. of Tech., Pasadena), and Sheldon K. Friedlander, inventors (to NASA) (JPL, California Inst. of Tech., Pasadena) Filed 17 Nov. 1980 13 p Sponsored by NASA (NASA-Case-NPO-15292-1; NASA-Case-NPO-15308-1; US-Patent-Appl-SN-207135) Avail: NTIS HC A02/MF A01 CSCL 13B

A device for indicating the composition of airborne particles such as those that pollute the air is described. The air containing particles to be analyzed, is drawn through a small diameter tube into a vacuum chamber. The individual particles pass in a straight line through the chamber and into skimmer opening. Few of the air molecules pass through the opening, but instead diffuse into other areas of the chamber. Each particle moving in free flight is detected by its scattering of a laser beam onto a photodetector. Then, a powerful laser pulse vaporizes and ionizes the particle. The ions from the particle are detected by a mass spectrometer. One novel feature is the moving of individual particles in free flight past a vaporizing and ionizing apparatus. NASA

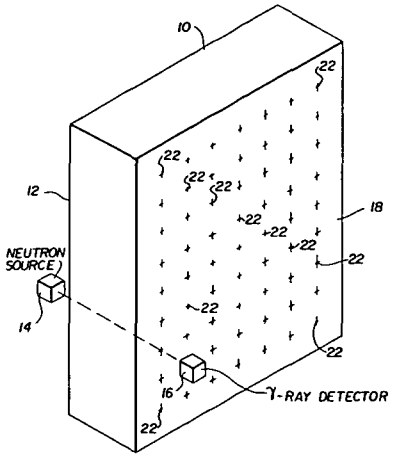


N83-20446*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

METHOD AND APPARATUS FOR MAPPING THE DISTRIBUTION OF CHEMICAL ELEMENTS IN AN EXTENDED MEDIUM Patent Application

Jacob I. Tromka and Larry G. Evans, inventors (to NASA) (Computer Science Corp.) Filed 31 Jan. 1983 17 p (NASA-Case-GSC-12808-1; US-Patent-Appl-SN-462497) Avail: NTIS HC A02/MF A01 CSCL 13B

A neutron/gamma ray technique for mapping the distribution of contaminants in an extended medium such as the wall of a building is described. A neutron excitation source is located on one side of the wall and a gamma ray spectrometer, including a gamma ray detector, is located on the opposite side of the wall facing the excitation source The source and detector are moved in unison in discrete steps over opposing wall surfaces so as to determine the chemical composition of the elements in a hemispheric region of the wall adjacent the detector with the radius of the region being substantially that of the mean free path distance of gamma rays emitted from elements interacting with neutrons on the detector side of the wall. NASA

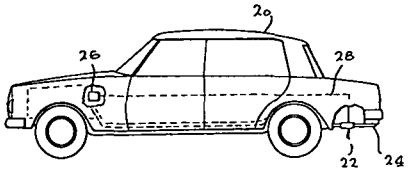


N83-20447*# National Aeronautics and Space Administration. Pasadena Office, Calif.

APPARATUS AND METHOD FOR DESTRUCTIVE REMOVAL OF PARTICLES CONTAINED IN A FLOWING FLUID Patent Application

Lien C Yang, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) Filed 14 Oct. 1980 25 p Sponsored by NASA (NASA-Case-NPO-15426-1, US-Patent-Appl-SN-196877) Avail: NTIS HC A02/MF A01 CSCL 13B

An apparatus and method for destructively removing particles from a flowing gas containing the particles is described. The apparatus is adapted to remove carbon particles from diesel engine exhaust products. The exhaust products are directed to a predetermined location where they are rapidly vaporized and combine with oxygen in the exhaust products to form carbon dioxide. Vaporization in one embodiment is effected by a discharge grid located within an exhaust conduit, the grid being chosen so that alternate conductors and defining the grid are spaced apart a distance approximately 125 times the mean diameter of the particles to be removed. NASA

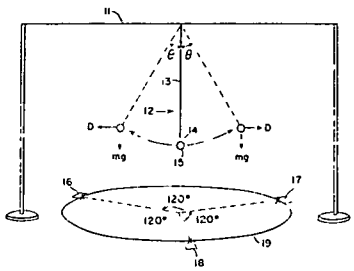


47 METEOROLOGY AND CLIMATOLOGY

Includes weather forecasting and modification.

N83-14863*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
A RADIONUCLIDE COUNTING TECHNIQUE FOR MEASURING WIND VELOCITY AND DIRECTION Patent Application
Jag J. Singh, inventor (to NASA) Filed 24 Nov. 1982 23 p (NASA-Case-LAR-12971-1; US-Patent-Appl-SN-444149) Avail: NTIS HC A02/MF A01 CSCL 04B

An anemometer utilizing a radionuclide counting technique for measuring both the velocity and the direction of wind is described. A pendulum consisting of a wire and a ball with a source of radiation on the lower surface of the ball is positioned by the wind. Detectors and are located in a plane perpendicular to pendulum (no wind). The detectors are located on the circumference of a circle and are equidistant from each other as well as the undisturbed (no wind) source ball position. NASA

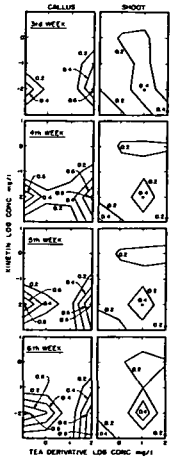


51 LIFE SCIENCES (GENERAL)

Includes genetics.

N83-17045* National Aeronautics and Space Administration. Pasadena Office, Calif.
ENHANCEMENT OF IN VITRO GUAYULE PROPAGATION Patent
Minoo N. Dastoor (JPL, California Inst. of Tech., Pasadena), Wayne W. Schubert (JPL, California Inst. of Tech., Pasadena), and Gene R. Petersen, inventors (to NASA) (JPL, California Inst. of Tech., Pasadena) Issued 30 Jun. 1981 7 p Filed 30 Jun. 1981 Supersedes N81-29728 (19 - 20, p 2811) Sponsored by NASA (NASA-Case-NPO-15213-1; US-Patent-4,363,188; US-Patent-Appl-SN-280153; US-Patent-Class-47-58; US-Patent-Class-71-98) Avail: US Patent and Trademark Office CSCL 06C

A method for stimulating in vitro propagation of Guayule from a nutrient medium containing Guayule tissue by adding a substituted trialkyl amine bioinducing agent to the nutrient medium is described. Selective or differentiated propagation of shoots or callus is obtained by varying the amounts of substituted trialky amine present in the nutrient medium. The luxuriant growth provided may be processed for its poly isoprene content or may be transferred to a rooting medium for production of whole plants as identical clones of the original tissue. The method also provides for the production of large numbers of Guayule plants having identical desirable properties such as high polyisoprene levels.
Official Gazette of the U.S. Patent and Trademark Office

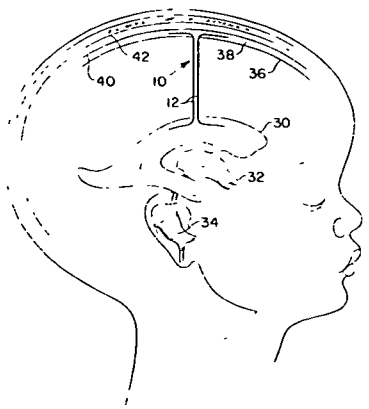


52 AEROSPACE MEDICINE

Includes physiological factors, biological effects of radiation; and weightlessness.

N83-20539*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
ION BEAM SPUTTER ETCHED VENTRICULAR CATHETER FOR HYDROCEPHALUS SHUNT Patent Application
Bruce A. Banks, inventor (to NASA) Filed 24 Nov. 1982 13 p (NASA-Case-LEW-13107-2; US-Patent-Appl-SN-444124) Avail. NTIS HC A02/MF A01 CSCL 06B

An improved cerebrospinal fluid shunt in the form of a ventricular catheter for controlling the condition of hydrocephalus by relieving the excessive cerebrospinal fluid pressure is described Method for fabricating the catheter and shunting the cerebral fluid from the cerebral ventricles to other areas of the body was improved. The obstruction of cerebrospinal fluid flow pathways or its inadequate absorption via the arachnoid villi into the venus blood of the brain results in hydrocephalus. Surgical correction involves pressure controlled shunting of the cerebrospinal fluid. The shunt will fail to function if the inlet ventricular catheter apertures become blocked. Shunt flow failure also occurs if 15 the ventricle collapses due to improper valve function causing over drainage. The ventricular catheter comprises a multiplicity of inlet microtubules. NASA



N83-21785* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
ION BEAM SPUTTER-ETCHED VENTRICULAR CATHETER FOR HYDROCEPHALUS SHUNT Patent
Bruce A. Banks, inventor (to NASA) Issued 10 Jun. 1983 7 p Filed 10 Jun. 1981 Supersedes N81-27786 (19 - 18, p 2531) (NASA-Case-LEW-13107-1; US-Patent-4,377,169; US-Patent-Appl-SN-272407; US-Patent-Class-604-8; US-Patent-Class-604-280) Avail: US Patent and Trademark Office CSCL 06C

A cerebrospinal fluid shunt in the form of a ventricular catheter for controlling the condition of hydrocephalus by relieving the excessive cerebrospinal fluid pressure is described. A method for fabrication of the catheter and shunting the cerebral fluid from the cerebral ventricles to other areas of the body is also considered. Shunt flow failure occurs if the ventricle collapse due to improper valve function causing overdrainage. The ventricular catheter comprises a multiplicity of inlet microtubules. Each microtubule has both a large openings at its inlet end and a multiplicity of microscopic openings along its lateral surfaces.
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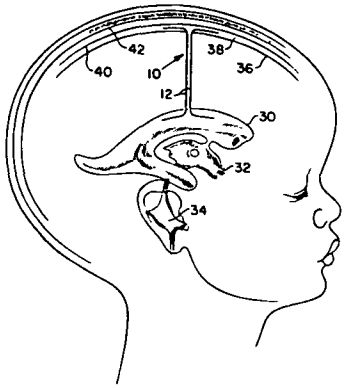
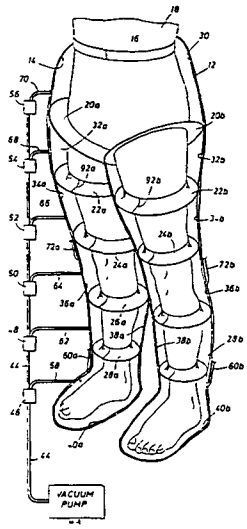


54 MAN/SYSTEM TECHNOLOGY AND LIFE SUPPORT

Includes human engineering; biotechnology; and space suits and protective clothing.

N83-18254*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
LOWER BODY NEGATIVE PRESSURE APPARATUS Patent Application
William E. Thornton, inventor (to NASA) Filed 2 Sep. 1982 24 p (NASA-Case-MSC-20202-1; US-Patent-Appl-SN-414106) Avail: NTIS HC A02/MF A01 CSCL 05H

A method and apparatus for simulating gravitational forces on a living organism are described wherein a series of negative pressures are externally applied to successive lengthwise sections of a lower limb of the organism, the pressures decreasing progressively with distance of the limb sections from the heart of the organism. A casing defines a chamber adapted to contain the limb of the organism and is rigidified to resist collapse upon the application of negative pressures to the interior of the chamber. Seals extend inwardly from the casing for effective engagement with the limb of the organism and, in cooperation with the limb, subdivide the chamber into a plurality of compartments each in a negative pressure communicating relation with the limb. Controls apply negative pressures to the compartment and maintain the negative pressures at incrementally different levels in respective ones of the compartments. NASA

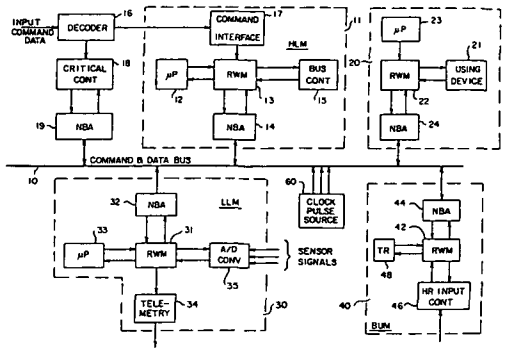


60 COMPUTER OPERATIONS AND HARDWARE

Includes computer graphics and data processing.
For components see *33 Electronics and Electrical Engineering*

N83-18290*# National Aeronautics and Space Administration. Pasadena Office, Calif
DISTRIBUTED MULTIPORT MEMORY ARCHITECTURE Patent Application
Wayne H. Kohl, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) Filed 30 Apr. 1981 26 p Sponsored by NASA (NASA-Case-NPO-15342-1; US-Patent-Appl-SN-258623) Avail: NTIS HC A03/MF A01 CSCL 09B

A multiport memory architecture is disclosed for each of a plurality of task centers connected to a command and data bus. Each task center includes a memory and devices which request direct memory access as needed. The memory includes an internal data bus and an internal address bus to which the devices are connected, and direct timing and control wgic comprised of a 10-state ring counter for allocating memory devices by enabling AND gates connected to the request signal lines of the devices. NASA

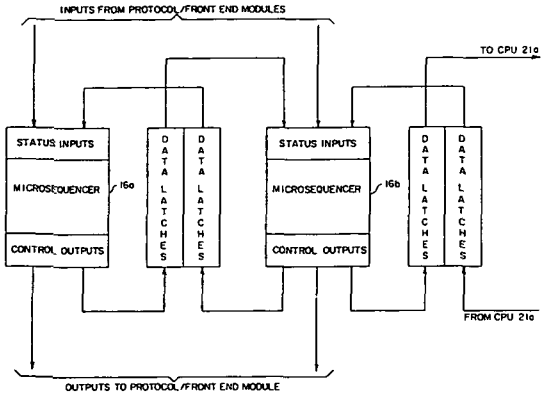


62 COMPUTER SYSTEMS

Includes computer networks.

N83-20634*# National Aeronautics and Space Administration. Pasadena Office, Calif.
MULTICOMPUTER COMMUNICATION SYSTEM Patent Application
Anil K Agrawal (JPL, California Inst. of Tech., Pasadena), Philip G. Mullen (JPL, California Inst. of Tech., Pasadena), and Vivatvong V. Vadakan, inventors (to NASA) (JPL, California Inst. of Tech., Pasadena) Filed 4 Apr. 1981 32 p Sponsored by NASA
(NASA-Case-NPO-15433-1; US-Patent-Appl-SN-250585) Avail: NTIS HC A03/MF A01 CSCL 09B

A local area network is provided for a plurality of autonomous computers which operate at different rates and under different protocols coupled by network bus adapters to a global bus. A host computer (HC) divides a message file to be transmitted into blocks, each with a header that includes a data type identifier and a trailer. The associated network bus adapter (NBA) then divides the data into packets, each with a header to which a transport header and trailer is added with frame type code which specifies one of three modes of addressing in the transmission of data, namely a physical address mode for computer to computer transmission using two bytes for source and destination addresses, a logical address mode and a data type mode. NASA

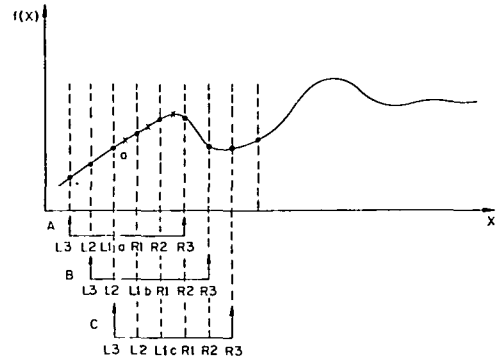


64 NUMERICAL ANALYSIS

Includes iteration, difference equations, and numerical approximation.

N83-12932*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
METHOD OF AND APPARATUS FOR GENERATING AN INTERSTITIAL POINT IN A DATA STREAM HAVING AN EVEN NUMBER OF DATA POINTS Patent Application
Thomas R. Edwards, inventor (to NASA) Filed 29 Oct. 1982 26 p
(NASA-Case-MFS-25319-1; US-Patent-Appl-SN-437917) Avail: NTIS HC A02/MF A01 CSCL 12A

Apparatus for doubling the data density rate of an analog to digital converter or doubling the data density storage capacity of a memory device is described. An interstitial data point midway between adjacent data points in a data stream having an even number of equal interval data points is generated by applying a set of predetermined one dimensional convolute integer coefficients which can include a set of multipler coefficients and a normalizer coefficient. Interpolator means apply the coefficients to the data points by weighting equally on each side of the center of the even number of equal interval data points to obtain an interstitial point value at the center of the data points. NASA

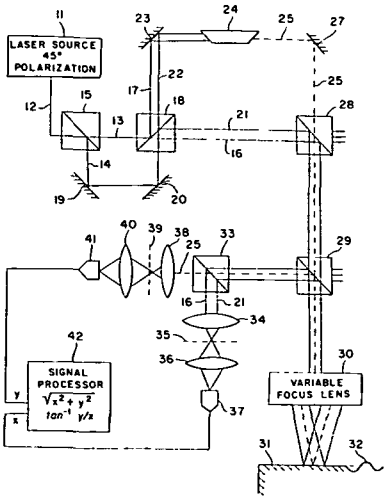


71 ACOUSTICS

Includes sound generation, transmission and attenuation. For noise pollution see *45 Environment Pollution.*

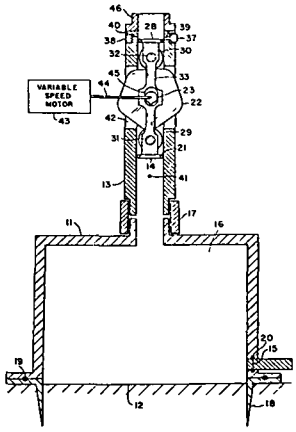
N83-12969*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
A DUAL DIFFERENTIAL INTERFEROMETER Patent Application
Richard O. Claus (Virginia Polytechnic Inst. and State Univ.) and Tyson M. Turner, inventors (to NASA) (Virginia Polytechnic Inst. and State Univ.) Filed 2 Sep. 1982 13 p Sponsored by NASA (NASA-Case-LAR-12966-1; US-Patent-Appl-SN-414237) Avail: NTIS HC A02/MF A01 CSCL 20A

A dual differential interferometer that measures both the amplitude and orientation of propagating, broadband ultrasonic surface acoustic waves (SAWs) is described. The invention consists essentially of two pairs of beams from two dual beam interferometers. These four beams are focused on the SAWs to be measured in a crosshair configuration. The straight lines between each set of dual beams are perpendicular to each other. The reflected beams are separated into pairs and then detected to produce two signals x and y. The two signals are processed y signal processor to provide both the amplitude and orientation of propagation of the SAWs. Separation of the reflected beams is accomplished by polarizing one pair of beams differently from the other pair before they are focused on the SAWs. Then the two pairs of reflected beams are separated in accordance with their different polarizations. NASA



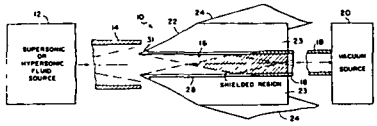
N83-15044*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
ACOUSTIC GROUND IMPEDANCE METER Patent Application
Allan J. Zuckerwar, inventor (to NASA) Filed 24 Nov. 1982 14 p
(NASA-Case-LAR-12995-1; US-Patent-Appl-SN-444150) Avail: NTIS HC A02/MF A01 CSCL 20A

A method and apparatus for measuring the acoustic impedance of a surface are described in which the surface is used to enclose one end of the chamber of a Helmholz resonator. Acoustic waves are generated in the neck of the resonator by a piston driven by a variable speed motor through a cam assembly. The acoustic waves are measured in the chamber and the frequency of the generated acoustic waves is measured by an optical device. These measurements are used to compute the compliance and conductance of the chamber and surface combined. The same procedure is followed with a calibration plate having infinite acoustic impedance enclosing the chamber of the resonator to compute the compliance and conductance of the chamber alone. Then by subtracting, the compliance and conductance for the surface is obtained. NASA



N83-17235* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
SOUND SHIELD Patent
Theodore R. Creel, Jr. and Ivan E. Beckwith, inventors (to NASA) Issued 28 May 1981 7 p Filed 28 May 1981 Supersedes N81-39138 (19 - 20, p 2729)
(NASA-Case-LAR-12883-1; US-Patent-4,363,237; US-Patent-Appl-SN-267935; US-Patent-Class-73-147) Avail: US Patent and Trademark Office CSCL 20A

An improved test section for a supersonic or hypersonic wind tunnel is disclosed wherein the model tested is shielded from the noise normally radiated by the turbulent tunnel wall boundary layer. A vacuum plenum surrounds spaced rod elements making up the test chamber to extract some of the boundary layer as formed along the rod elements during a test to thereby delay the tendency of the rod boundary layers to become turbulent. Novel rod construction involves bending each rod slightly prior to machining the bent area to provide a flat segment on each rod for connection with the flat entrance fairing. Rods and fairing are secured to provide a test chamber incline on the order of 1 deg outward from the noise shield centerline to produce up to 65% reduction of the root mean square (rms) pressure over previously employed wind tunnel test sections at equivalent Reynolds numbers.
Official Gazette of the U.S. Patent and Trademark Office

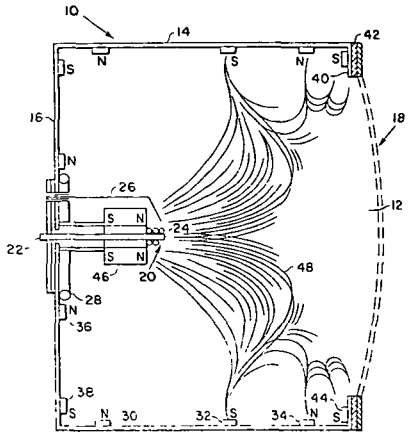


72 ATOMIC AND MOLECULAR PHYSICS

Includes atomic structure and molecular spectra.

N83-21903*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
RING-CUSP ION THRUSTER WITH SHELL ANODE Patent Application
James S. Sovey, Vincent K. Rawlin, and Robert F. Roman, inventors (to NASA) Filed 9 Mar. 1983 12 p
(NASA-Case-LEW-13881-1; US-Patent-Appl-SN-473498) Avail: NTIS HC A02/MF A01 CSCL 20H

An ion thruster for low specific impulse operation in the 1500 sec to 6000 sec range has a multicusp boundary field provided by high strength magnets on an iron anode shell which lengthens the paths of electrons from a hollow cathode assembly. A downstream anode pole piece in the form of an iron ring supports a ring of magnets to provide a more uniform beam profile. A cylindrical cathode magnet can be moved selectively in an axial direction along a feed tube to produce the desired magnetic field at the cathode tip. NASA



73 NUCLEAR AND HIGH-ENERGY PHYSICS

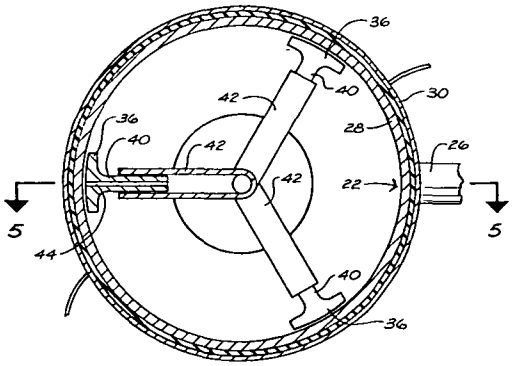
Includes elementary and nuclear particles; and reactor theory.

For space radiation see *93 Space Radiation.*

N83-12986*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.
APPARATUS AND METHOD TO KEEP THE WALLS OF A FREE SPACE REACTOR FREE FROM DEPOSITS OF SOLID MATERIALS Patent Application
Kazuo A. Yamakawa (JPL, California Inst. of Tech., Pasadena) Filed 8 Sep. 1982 23 p
(Contract NAS7-100)
(NASA-Case-NPO-15851-1; US-Patent-Appl-SN-415879) Avail: NTIS HC A02/MF A01 CSCL 18K

An apparatus and method is described for keeping interior walls of a reaction vessel free of undesirable deposits of solid materials in gas-to-solid reactions. The apparatus includes a moveable cleaning head which is configured to be substantially complementary to the interior contour of the walls of the reaction vessel and which is disposed in close proximity to the walls. The head ejects a stream of gas with a relatively high velocity into a narrow space between the head and the walls, and in accordance with Bernoulli's principle the head is biased towards the walls by

the pressure prevailing in the reaction vessel. The gas ejected from the head is of such composition that it does not participate significantly in the chemical reaction conducted in the reaction vessel. NASA



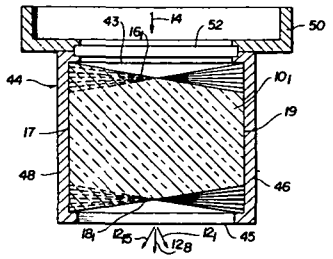
74 OPTICS

Includes light phenomena.

N83-10900* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
MULTIPRISM COLLIMATOR Patent
Peter O. Minott, inventor (to NASA) Issued 21 Sep. 1982 7 p Filed 8 Oct. 1980 Supersedes N81-12387 (19 - 03, p 0346)
(NASA-Case-GSC-12608-1, US-Patent-4,350,410; US-Patent-Appl-SN-195228; US-Patent-Class-350-170; US-Patent-Class-350-286) Avail: US Patent and Trademark Office CSCL 20F

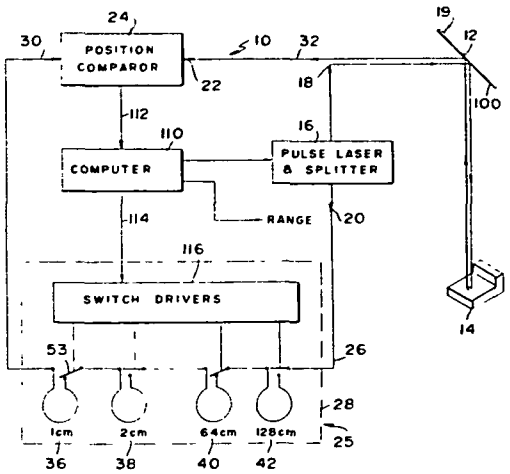
A special purpose optical collimator system which generates multiple collimated light beams with precisely related angular separation of the beams, is comprised of a stack of relatively flat plate-like refracted prisms in the form of wedges. Each prism has a specified angular deviation, mounted on top of one another in a fixture which holds the wedges so that they are adapted to operate at minimum angular deviation and thus are relatively insensitive to rotational and angular charges. A collimated sources of monochromatic light, generated for example by a helium-neon laser and a collimated beam expander, provides a common incident beam to the wedges whereupon a number equally spaced emergent beams are provided.

Official Gazette of the U.S. Patent and Trademark Office



N83-12991*# *National Aeronautics and Space Administration.* Pasadena Office, Calif.
RANGING SYSTEM Patent Application
John M. McLauchlan (JPL, California Inst. of Tech., Pasadena), John Au Yeung (JPL, California Inst. of Tech. Pasadena), Eldred F. Tubbs (JPL, California Inst. of Tech., Pasadena), Willis C. Goss (JPL, California Inst. of Tech., Pasadena), and Demetri Psaltis (JPL, California Inst. of Tech., Pasadena) Filed 28 Sep. 1982 18 p
(NASA-Case-NPO-15865-1; US-Patent-Appl-SN-425202) Avail: NTIS HC A02/MF A01 CSCL 20F

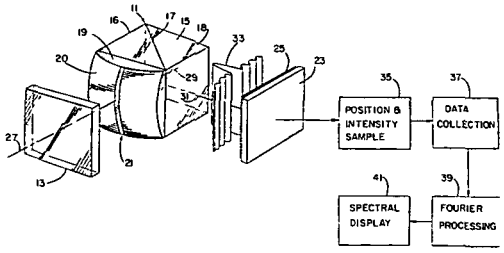
An accurate, relatively simple system of rugged design, useful in industrial robotics, is described for measuring the distance to an object, with a second component of the light pulse that passes along a reference path of known length. The reference path can be changed in precise steps so that it has an equivalent length approximately equal to the path length of the light pulse component that is reflected from the object. The resulting small difference in path lengths can be precisely determined by directing the light pulse components into opposite ends of a detector formed of a material that emits a second harmonic light output at the locations where the opposite-going pulses pass simultaneously across one another. NASA



N83-12992*# National Aeronautics and Space Administration. Pasadena Office, Calif.
INTEGRATED OPTICS IN AN ELECTRICALLY SCANNED IMAGING FOURIER TRANSFORM SPECTROMETER Patent Application
James B. Breckinridge (JPL, California Inst. of Tech., Pasadena) and Fred G. OCallaghan (JPL, California Inst. of Tech., Pasadena) Filed 10 Jul. 1982 18 p
(Contract NAS7-100)
(NASA-Case-NPO-15844-1; US-Patent-Appl-SN-416443) Avail: NTIS HC A02/MF A01 CSCL 20F

An efficient, lightweight and stable, Fourier transform spectrometer was developed. The mechanical slide mechanism needed to create a path difference was eliminated by the use of retro-reflecting mirrors in a monolithic interferometer assembly in which the mirrors are not at 90 degrees to the propagation vector of the radiation, but rather at a small angle. The resulting plane wave fronts create a double-sided inteferogram of the source irradiance distribution which is detected by a charge-coupled device image sensor array. The position of each CCD pixel in the array is an indication of the path difference between the two retro-reflecting mirrors in the monolithic optical structure. The Fourier transform of the signals generated by the image sensor provide the spectral irradiance distribution of the source. For imaging, the interferometer assembly scans the source of irradiation by moving the entire instrument, such as would occur if it was fixedly mounted to a moving platform,

i.e., a spacecraft. During scanning, the entrace slot to the monolithic optical structure sends different pixels to corresponding interferograms detected by adjacent columns of pixels of the image sensor. NASA



N83-13978* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

RHOMBOID PRISM PAIR FOR ROTATING THE PLANE OF PARALLEL LIGHT BEAMS Patent

Kenneth L. Orloff, inventors (to NASA) (ARO, Inc., Tullahoma, Tenn.) and Haruo Yanagita (ARO, Inc , Tullahoma, Tenn.) Issued 26 Oct. 1982 5 p Filed 24 Dec. 1980 Supersedes N81-16882 (19 - 07, p 0975) Sponsored by NASA (NASA-Case-ARC-11311-1; US-Patent-4,355,870; US-Patent-Appl-SN-219640; US-Patent-Class-350-486; US-Patent-Class-350-287) Avail US Patent and Trademark Office CSCL 20F

An optical system is described for rotating the plane defined by a pair of parallel light beams. In one embodiment a single pair of rhomboid prisms have their respective input faces disposed to receive the respective input beams. Each prism is rotated about an axis of revolution coaxial with each of the respective input beams by means of a suitable motor and gear arrangement to cause the plane of the parallel output beams to be rotated relative to the plane of the input beams. In a second embodiment, two pairs of rhomboid prisms are provided. In a first angular orientation of the output beams, the prisms merely decrease the lateral displacement of the output beams in order to keep in the same plane as the input beams. In a second angular orientation of the prisms, the input faces of the second pair of prisms are brought into coincidence with the input beams for rotating the plane of the output beams by a substantial angle such as 90 deg.

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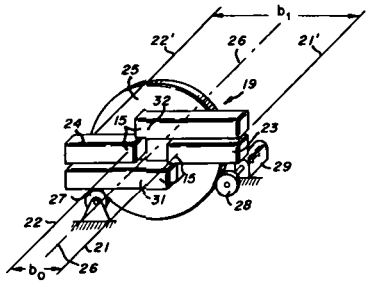
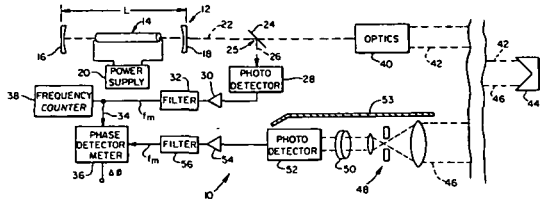


N83-13982*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

OPTICAL DISTANCE MEASURING INSTRUMENT Patent Application

James B. Abshire, inventor (to NASA) Filed 10 Aug. 1982 18 p (NASA-Case-12761-1; US-Patent-Appl-SN-406820) Avail: NTIS HC A02/MF A01 CSCL 20F

An optical instrument, such as a stability monitor or a target range finder, uses an unstabilized laser to project a composite optical signal of coherent light having two naturally occurring longitudinal mode components. A beamsplitter divides the signal into a reference beam which is directed toward one photodetector and a transmitted beam which illuminates and is reflected from a distant target onto a second photodetector optically isolated from the first photodetector. Both photodetectors are operated on the square law principle to provide electrical signals modulated at a frequency equal to the separation between the frequencies of the two longitudinal mode components of the optical signal projected by the laser. Slight movement of the target may be detected and measured by electrically monitoring the phase difference between the two signals provided by the photodetectors and the range of the target measured with the aid of microprocessor by changing the separation between the longitudinal modes by shifting the length of the resonator cavity in an iterative series of increments. NASA

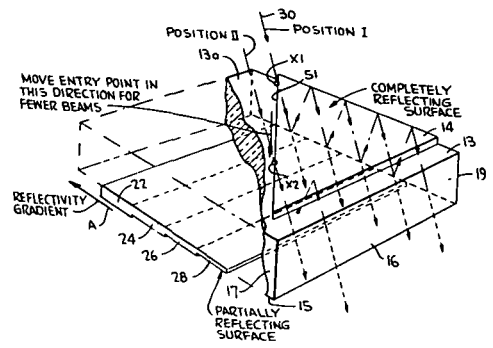


N83-17305* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

COLLIMATED BEAM MANIFOLD WITH THE NUMBER OF OUTPUT BEAMS VARIABLE AT A GIVEN OUTPUT ANGLE Patent

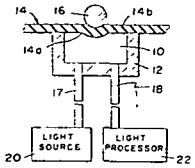
Cecil W. Campbell and Robert B. Owen, inventors (to NASA) Issued 15 Sep. 1980 5 p Filed 15 Sep. 1980 Supersedes N80-34251 (18 - 24, p 3353) (NASA-Case-MFS-25312-1; US-Patent-4,362,361; US-Patent-Appl-SN-187106; US-Patent-Class-350-171) Avail: US Patent and Trademark Office CSCL 20F

An optical manifold is described which transforms a collimated beam, such as a laser beam, into a plurality of parallel beams having uniform intensity or having a desired intensity ratio. The manifold comprises an optical substrate coated on its rear surface with a fully reflective layer and on its front surface with a partially reflecting layer having a reflectivity gradient. An input collimated beam entering the rear surface and impinging on the front surface is reflected, multiply between the front and rear surfaces producing a plurality of parallel beams that emerge from the front surface. The intensities of the emerging beams have a relationship that depends on the reflectivity of the front surface at the points where the beams emerge. By properly selecting the reflectivity gradient, the emerging beams have uniform intensity or a desired intensity ratio. Official Gazette of the U.S. Patent and Trademark Office



N83-18485*# National Aeronautics and Space Administration. Pasadena Office, Calif.
OPTICAL FIBER TACTILE SENSOR Patent Application
Antal K. Bejczy, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) Filed 25 Nov. 1980 16 p Sponsored by NASA (NASA-Case-NPO-15375-1; US-Patent-Appl-SN-210405) Avail: NTIS HC A02/MF A01 CSCL 20F

A tactile sensor with optical fibers is described. The novel sensor includes a plurality of cells. Each cell is formed as an open cavity in a solid material. The cell is closed off by an elastic membrane. A pair of light conductors preferrably optical fibers transient light into the cell and conduct reflected light from the cell. Distortion in the elastic membrane due to contact with an object charges the amount of reflected light, thereby indicating contact with the sensor The novelty of the invention is believed to reside in the use of light with optical fibers to provide tactile information of high resolution with minimal interference from external electrical magnetic fields. NASA



N83-19596* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
HEAT PIPES CONTAINING ALKALI METAL WORKING FLUID Patent
James F. Morris, inventor (to NASA) Issued 16 Mar. 1981 4 p Filed 16 Mar. 1981 Supersedes N81-22310 (19 - 13, p 1756) (NASA-Case-LEW-12253-1; US-Patent-4,372,377; US-Patent-Appl-SN-243682; US-Patent-Class-165-104.26; US-Patent-Class-165-134R; US-Patent-Class-29-157.3H) Avail: US Patent and Trademark Office CSCL 20F

A technique for improving high temperature evaporation-condensation heat-transfer devices which have important and unique advantage in terrestrial and space energy processing is described. The device is in the form of a heat pipe comprising a sealed container or envelope which contains a capillary wick. The temperature of one end of the heat pipe is raised by the input of heat from an external heat source which is extremely hot and corrosive. A working fluid of a corrosive alkali metal, such as lithium, sodium, or potassium transfers this heat to a heat receiver remote from the heat source. The container and wick are fabricated from a superalloy containing a small percentage of a corrosion inhibiting or gettering element. Lanthanum, scandium, yttrium, thorium, and hafnium are utilized as the alloying metal.

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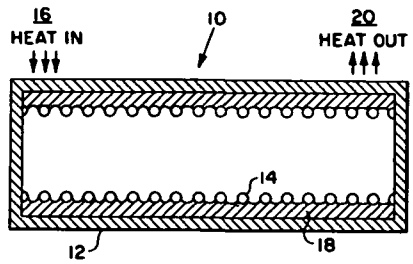

N83-19597* National Aeronautics and Space Administration. Pasadena Office, Calif.
BROADBAND OPTICAL RADIATION DETECTOR Patent
Amitava Gupta (JPL, California Inst. of Tech., Pasadena), Su-Don Hong (JPL, California Inst. of Tech., Pasadena), and Jovan Moacanin, inventors (to NASA) (JPL, California Inst. of Tech., Pasadena) Issued 14 Apr. 1981 11 p Filed 30 Jul. 1979 Sponsored by NASA (NASA-Case-14864-1; US-Patent-4,262,198; US-Patent-Appl-SN-061822; US-Patent-Class-250-340; US-Patent-Class-250-227; US-Patent-Class-250-332; US-Patent-Class-250-350; US-Patent-Class-250-351; US-Patent-Class-350-353) Avail: US Patent and Trademark Office CSCL 20F

A method and apparatus for detecting optical radiation by optically monitoring temperature changes in a microvolume caused by absorption of the optical radiation to be detected is described. More specifically, a thermal lens forming material is provided which has first and second opposite, substantially parallel surfaces. A reflective coating is formed on the first surface, and a radiation absorbing coating is formed on the reflective coating. Chopped, incoming optical radiation to be detected is directed to irradiate a small portion of the radiation absorbing coating. Heat generated in this small area is conducted to the lens forming material through the reflective coating, thereby raising the temperature of a small portion of the lens forming material and causing a thermal lens to be formed therein.

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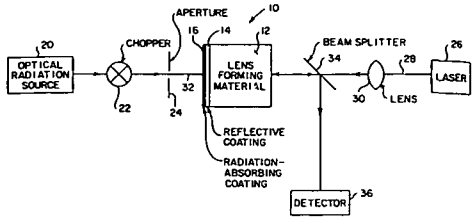
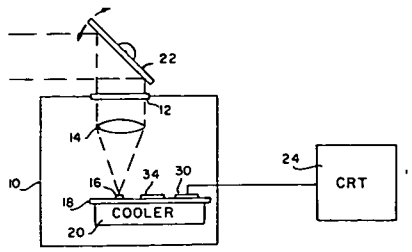


N83-20757*# National Aeronautics and Space Administration. Pasadena Office, Calif.
INTEGRATING IR DETECTOR IMAGING SYSTEMS Patent Application
Gary C. Bailey, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) Filed 25 Aug. 1981 13 p Sponsored by NASA (NASA-Case-NPO-15805-1; US-Patent-Appl-SN-296137) Avail: NTIS HC A02/MF A01 CSCL 20F

An integrating IR detector array for imaging is provided in a hybrid circuit with InSb mesa diodes in a linear array, a single J-FET preamplifier for readout, and a silicon integrated circuit multiplexer. Thin film conductors in a fan out pattern deposited on an Al2O3 substrate connect the diodes to the multiplexer, and thick film conductors also connect the reset switch and preamplifier to the multiplexer. Two phase clock pulses are applied with a logic return signal to the multiplexer through a triax comprised of three thin film conductors deposited between layers. A lens focuses a scanned image onto the diode array for horizontal read out while a scanning mirror provides vertical scan. B.G.



N83-21949* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif

DUAL-BEAM SKIN FRICTION INTERFEROMETER Patent

Daryl J. Monson, inventor (to NASA) Issued 10 Jul 1981 8 p Filed 10 Jul 1981 Supersedes N81-29415 (19 - 20, p 2769)
(NASA-Case-ARC-11354-1; US-Patent-4,377,343; US-Patent-Appl-SN-282192, US-Patent-Class-356-357, US-Patent-Class-73-147) Avail: US Patent and Trademark Office CSCL 20F

A portable dual-laser beam interferometer is described that nonintrusively measures skin friction by monitoring the thickness change of an oil film at two locations while said oil film is subjected to shear stress An interferometer flat is utilized to develop the two beams. Light detectors sense the beam reflections from the oil film and the surface thereunder. The signals from the detectors are recorded so that the number of interference fringes produced over a given time span may be counted.

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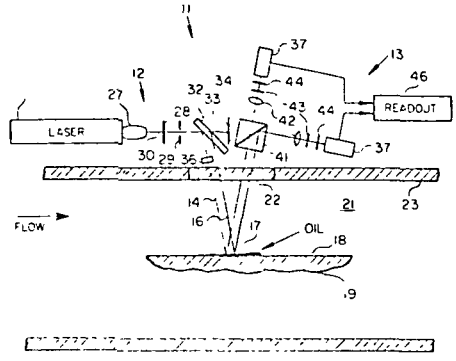
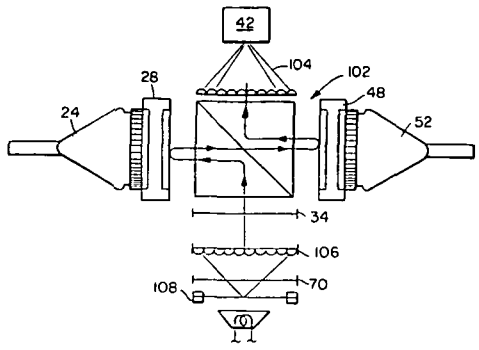


N83-21950*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

OPTICAL STEREO VIDEO SIGNAL PROCESSOR Patent Application

Glenn D. Craig, inventor (to NASA) Filed 9 Mar. 1983 18 p
(NASA-Case-MFS-25752-1; US-Patent-Appl-SN-473499) Avail: NTIS HC A02/MF A01 CSCL 20F

An optical video signal processor which produces a two-dimensional cross-correlation is disclosed in real time of images received by a stereo camera system. The optical image of each camera is projected on respective liquid crystal light valves. The images on the liquid crystal valves modulate light produced by an extended light source. This modulated light output becomes the two-dimensional cross-correlation when focused onto a video detector and is a function of the range of a target with respect to the stereo camera. Alternate embodiments utilize the two-dimensional cross-correlation to determine target movement and target identification. NASA



76 SOLID-STATE PHYSICS

Includes superconductivity.

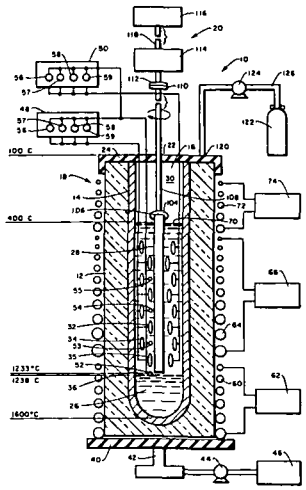
For related information, see also *33 Electronics and Electrical Engineering* and *36 Lasers and Masers.*

N83-15149*# National Aeronautics and Space Administration. Pasadena Office, Calif.

TOTAL IMMERSION CRYSTAL GROWTH Patent Application

Andrew D. Morrison, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) Filed 18 Nov. 1982 21 p
(Contract NAS7-100)
(NASA-Case-NPO-15800-1; US-Patent-Appl-SN-442815) Avail: NTIS HC A02/MF A01 CSCL 20B

Crystals of wide band gap materials are produced by positioning a holder receiving a seed crystal at the interface between a body of molten wide band gap material and an overlying layer of temperature-controlled, encapsulating liquid. After initiation of crystal growth, the crystal is pulled through the layer until the crystal is solidified. The crystal then enters the ambient gas headspace which may also be temperature controlled. The crystal can be pulled vertically by means of a pulling-rotation assembly or horizontally by means of a low-angle withdrawal mechanism. The encapsulating layer is controlled by heating and/or cooling elements submerged with the layers and connected in closed loop with power supplies by means of temperature sensing elements. These elements control and provide nucleation and growth of a more perfect crystal in the elongated, heat exchange, encapsulating fluid medium. NASA



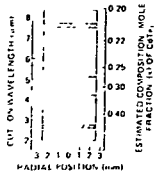
N83-18533*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

METHOD OF PREPARING RADIALLY HOMOGENEOUS MERCURY CADMIUM TELLURIDE CRYSTALS Patent Application

Sandor L. Lehoczky (McDonnell Douglas Corp., St. Louis, Mo.) and Frank R. Szofran, inventors (to NASA) (McDonnell Douglas Corp., St. Louis, Mo.) Filed 15 Nov. 1982 15 p Sponsored by NASA
(NASA-Case-MFS-25786-1; US-Patent-Appl-SN-411896) Avail: NTIS HC A02/MF A01 CSCL 20B

A directional solidification method for preparing mercury cadmium telluride crystals is described. Hg1-xCdxTe is prepared by means of a directional solidification method in which a precast alloy sample containing predetermined amounts of H, Cd and Te is disposed in a sealed ampule and a furnace, providing two

controlled temperature zones, is translated upward past the ampule so as to provide melting and resolidification. The improvement is directed to maintaining the zones at temperatures determined in accordance with a prescribed formula, providing a thermal barrier between the zones with a maximum thickness and translating the furnace past the zones at a rate less than 0.31 m/sec. Zone temperatures are selected according to the formula T sub U4 - T sub l4 = T sub l4 - T sub l4 where T sub u is the upper zone temperature, in Kelvins, T sub L is the lower zone temperature and T sub l is the solidus temperature for the particular material composition.
NASA



N83-20789* National Aeronautics and Space Administration. Pasadena Office, Calif.
CONTROLLED IN SITU ETCH-BACK Patent
Robert J. Mattauch (JPL, California Inst. of Tech., Pasadena) and Alan C. Seabaugh, inventors (to NASA) (JPL, California Inst. of Tech., Pasadena) Issued 20 Nov. 1981 5 p Filed 30 Nov. 1981 Supersedes N82-25995 (20 - 16, p 2312) Sponsored by NASA (NASA-Case-NPO-15625-1; US-Patent-4,373,989; US-Patent-Appl-SN-325933; US-Patent-Class-156-635; US-Patent-Class-148-173; US-Patent-Class-148-175; US-Patent-Class-156-608; US-Patent-Class-156-624; US-Patent-Class-156-654; US-Patent-Class-156-662) Avail: US Patent and Trademark Office CSCL 20B

A controlled in situ etch-back technique is disclosed in which an etch melt and a growth melt are first saturated by a source-seed crystal and thereafter etch-back of a substrate takes place by the slightly undersaturated etch melt, followed by LPE growth of a layer by the growth melt, which is slightly supersaturated.
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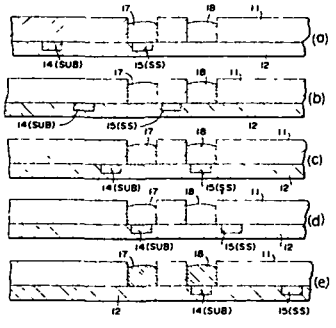

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Section 1: Abstracts

16. Abstract

This bibliography is issued in two sections: Section 1 - Abstracts, and Section 2 - Indexes. This issue of the Abstract Section cites 129 patents and applications for patent introduced into the NASA scientific and technical information system during the period of January 1983 through June 1983. Each entry of the Abstract Section consists of a citation, an abstract, and in most cases, a key illustration selected from the patent or application for patent.

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